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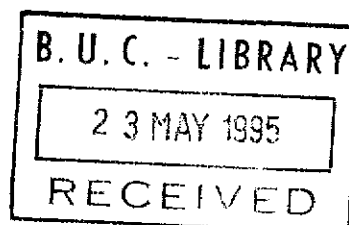
**ASSESSMENT OF  
DECISION-MAKING TECHNIQUES  
APPLIED IN  
LEBANESE BUSINESSES**

**By**

**TAREK FAROUK AYASS**

**A project  
submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science in Business Administration**

*Spring 1995*



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**“Approval Of Project”**

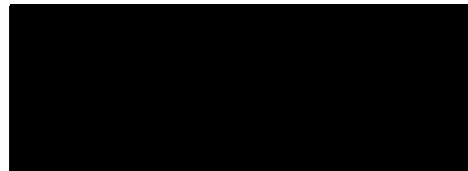
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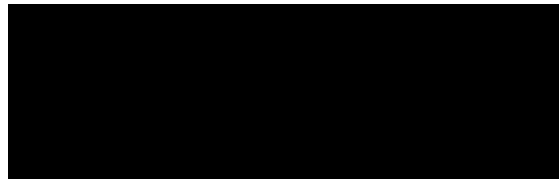
“Assessment of Decision-Making Techniques  
Applied in Lebanese Businesses.”

The following professors nominated to serve as the advisors of the above mentioned candidate have approved his research project:

Dr. Hussein Hejase  
Name



Dr. Tarek Mikdashi  
Name



Beirut University College  
Beirut - Lebanon

“Research Project Release From”

*I, Tarek Farouk Ayass, authorize the BMC to supply copies of my research project to libraries or individuals upon request.*

19/05/95  
Date

  
Signature

## **Dedication**

**To my father, mother, sister and brothers...**

**To the very special Aida Talhouk...**

**To my sweetest Mayada...**

**To all my friends at BUC Guidance Office...**

**To all assistants at BUC Business School...**



## Acknowledgment

*Let this page be an opportunity of expressing my full gratitude and appreciation to the effort and concern given by Dr. Hussein Hejase. Also, special thanks are for my advisor, Dr. Tarek Mikdashi, for his support throughout my graduate years at the Business School. Sincere thanks are dedicated to Dr. Riyad Nassar, president of LAll.... To Mr. Fawzi Hajjar, vice president of LAll... to Mr. Elias Baz, Director of Administration at LAll.... to Mrs. Aida Talhouk, Director of Guidance at LAll.... And to all those who contributed in one way or another to the fulfillment of this research project.*

## *Abstract*

Decision making is an emerging area of study of considerable importance to practicing managers, as well as to teachers and students of management. Regrettably, the subject of decision making is usually seen as merely one of several activities that differentiate managers from other employees in an organization. However, this is not really the case, for every individual, belonging to the organization, participates in the process of decision making by one way or another.

The multiple dimensions of arriving at a choice contribute significantly to the complexity of the decision-making process. Much additional research is necessary before decision making can be revealed in all its diversity. In the meantime, managers, teachers and students should try to adopt a broader perspective toward decision making. This perspective should place decision making at the center of the manager's functions. It should focus squarely on the many variables and antecedent conditions leading up to the moment of choice. It should acknowledge the many related considerations that must be taken into account when the choice is put in effect. Also, this perspective should reflect the need to control events in a manner consistent with the original objective of the decision.

Throughout this study, the researcher aimed at clarifying the guidelines needed to create the above mentioned perspective, keeping in mind the contrast between the American decision-making approaches versus those one followed by the Lebanese managers.

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# Chapter I

## Introduction

### A. Decision Making: An Overview

Our present complex environment calls for a new logic- a new way to cope with the myriad factors that affect the achievement of goals and the consistency of the judgments used to draw valid conclusions. This approach should be justifiable and appeal to one's wisdom and good sense. It should not be so complex that only the educated can use it, but should serve as a unifying tool for thought in general.

Understanding of the world not only needs repetition to improve the recollection and precision, but it also depends very much on the *intensity* of one's participation. It is an exaggeration to conclude that humans are logical creatures. It is more accurate to say that one's judgment depends on the totality of impressions even if they cannot be logically and rigorously justified. For better understanding one needs to deal with experience as an ongoing process. He needs concentration, repetition, diversity, debate, and, when necessary, consensus. Having a clearly defined goal has again been demonstrated to be the core of successful statecraft. Being consistent is another vital ingredient. Persuasion and support for one's view are still considered two of the main attributes of a great leader. What follows is largely designed to help leaders get their point across.

More and more people are finding it hard to pull all their trust in the unspoken, unjustified, and intuitive thinking of their leaders' decisions on complex matters. Whatever internal mechanism leaders have needed to be articulated and understood. Just as language itself and the rules of thought had to be organized in a formal manner long ago, so must thought processes be organized so as to lead to good decisions. The process contributes to solving complex problems by structuring a hierarchy of criteria, stakeholders, and outcomes and by eliciting judgments to develop priorities. It also leads to prediction of likely outcomes according to these judgments. The outcome can be used to rank alternatives, allocate resources, conduct cost/benefit comparisons, exercise control in the system by evaluating the sensitivity of the outcome to changes in judgment, and carry out planning of projected and desired futures.

Decision making is an emerging area of study of considerable importance to practicing managers, as well as to teachers and students of management. Regrettably, the subject of decision making is usually seen as merely one of several activities that differentiate managers from other employees in an organization. However, this is not really the case, for every individual, belonging to the organization, participates in the process of decision making by one way or another.

The multiple dimensions of arriving at a choice contribute significantly to the complexity of the decision-making process. Much additional research is necessary before decision making can be revealed in all its diversity. In the meantime, managers, teachers, and students should try to adopt a broader perspective toward decision making. This perspective should place decision

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making at the center of the manager's functions. It should focus squarely on the many variables and antecedent conditions leading up to the moment of choice. It should acknowledge the many related considerations that must be taken into account when the choice is put into effect. Finally this perspective should reflect the need to control events in a manner consistent with the original objective of the decision. This research will provide the reader with such a perspective.

Decision making is an integral part of the management of any kind of organization. More than anything else, competence in this activity differentiates the manager from the non-manager and, more important, the effective manager from the ineffective manager. Managers' opinions about their own decision-making abilities are heavily influenced by what they feel a good decision is. For some it is a choice arrived at by the consensus of one or more groups in the organization. For others it is any decision that does not elicit unfavorable reactions from those affected by it. Or it may simply be the choice among available alternatives that offers the highest possible payoff. Or perhaps it is a decision reached after a careful search for alternatives within clear boundaries and one that will be implemented smoothly with obvious benefits to those affected by it.

This diversity of viewpoints about the goals and techniques of decision making renders it difficult to evaluate a manager's abilities and performance in this area. There is no universal agreement on what constitutes a really good decision, and there is no generally an accepted approach to good decision making. Much is assumed, but considerably less is known about this most important managerial activity. It is hoped that this research, through the presentation of relevant theory and viable conceptual frameworks, will help managers in organizations of all types to become more effective decision makers.

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Decision making is simply a moment in an ongoing process of evaluating alternatives for meeting an objective. It is the moment when a decision maker selects the course of action that appears most likely to result in the attainment of the objective. The decision making process is presented as generic, based on the premise that the making of choices is endemic to all levels of management in all types of organized activity throughout the world. It is also noted that decision theory is still a relatively new field. Most current orientations have a strong quantitative emphasis that focuses on the decision itself, rather than on the process within which the choices take place. It is merely significant that a decision is simply a means to an end, not, as is frequently assumed, an end in itself. The end is, of course, the outcome that will result from the choice- an outcome that hopefully will attain the objective(s) that gave rise to the integrated, process of decision making. Finally, decision making is the one activity that truly differentiates management from other forms of endeavor in the total society. The acceptance of this fact seems certain to result in more effective decision making in all types of organized activity.

#### **B. Purpose Of The Study:**

Without sound decision making an organization will have to rely on continuing good luck to maintain adequate performance. Thus, a primary purpose of working on this study is to introduce different ways of making decisions in a complex environment. Moreover, this study aims to find out whether top-level management in the Lebanese business sector has a true conception of several key terms, or "concepts", related to the process of decision making. Such concepts

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have to do with “leadership”, “problem solving”, “brainstorming”, subjective approaches versus objective ones, to decision making. In general, the main objective of this project is to *study the decision making process followed by a sample of Lebanese managers, and to assess the decision making structure in comparison with the American decision making practice.*

### **C. Need For The Study:**

Because of the remarkable progress of business practices, and because of the technological evolution that is accompanying the business world, the process of decision making turned to be realized as an important and critical issue to Lebanese people in general, and to Lebanese businessmen in particular.

This study is for those who must set priorities and make decisions. Perhaps their many activities, both daily and long range, do not permit them to analyze situations at a microscopic level, but they must be able to assess the overall situation in which they have to make the decision together with its consequences. Thus we shall address those with a certain level of expertise in their field, besides ordinary people, for the methods represented in chapter two can give faithful answers primarily when the information itself is faithful. The study will provide these people with a wider scope with which they can meet the continuously challenging future.

The decision making process is considered to be the main component of a prosperous business. Without it a business can not achieve a competitive edge needed by any business to survive. Decision making can no more be practiced randomly; a systematic, analytic, and scientific criteria should be the origin of any decision.

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**D. Statement Of The Problem:**

Most of the Lebanese businesses are family-owned businesses. That is why the owner of the business seems to have certain aversion against letting strangers (managers and executive people) interfere in the process of decision making and setting the guidelines for their business's future plans. The very thing that makes the process of decision making divert from the right path and let it be more of a "one-man show" business.

This project will be dedicated to all businessmen, and especially the Lebanese ones, to show them that decision making is not an easy thing. It is a process by all means. Certain characteristics should be available before, at the time, and after undertaking this process. It is also worth mentioning that the decision-making process is not a fixed process that can be practiced in any situation or in any case; a decision maker in one case might not be the right decision maker in another.

**E. Methodology:**

The approach used to collect data in this research is highly structured in order to make people's responses comparable. Thus, this research is a descriptive one based on presenting information from two resources: Primary and Secondary.



**E.1. Secondary Data:**

Several business journals and books were used to accomplish this research: First to provide the proper guidelines for conducting this research. Second, to collect relevant information for this study.

**E.2. Primary Data:**

The main sources of information for this research are the interviews conducted with Lebanese managers. Questions addressed are standardized, so that the differences in people's responses can be attributed to genuine variations and not to divergence in the manner or order of asking questions.

**F. Limitations Of The Study:**

In spite of the efforts exhibited by the researcher to get the most reliable and unbiased information, it can not be claimed that this research covers all Lebanese businesses. The researcher tries to cover the widest business scope possible, however a complete coverage is more of an impossible task for many reasons most of which are time and cost related.

**G. Construction Of The Study:**

The research is constructed in a way to lead the reader to understand the need for decision-making and to show the extent to which the process is applied in Lebanese businesses. Chapter One is introductory presenting the purpose and the need for this research. The second chapter describes the qualitative and quantitative approaches to decision making and gives a global conception for decision making as a business practice. Chapter three discusses the procedure and methodologies adopted in analyzing the data collected. Chapter four presents the findings of data analysis, and chapter five proposes a summary of findings and presents viable recommendations according to the researcher's evaluation.

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## Chapter 2

### Literature Review

#### I. Small Group Decision Making

##### A. The Group Context

Communication and the Group Process emphasize two common perspectives within the group context- decision making and communication. While groups serve multitudes of purposes in our society, probably the most typical of all real-life groups, is that group which performs some form of decision-making. On the other side, communication is often defined as merely the transmitting and receiving of messages. It is considered the organizing element of the group. Through communication human beings process information, test ideas, exchange opinions, and achieve consensus on decisions. Through communication human beings develop interpersonal relationships and form "groups" from aggregates of individuals. Thus, communication is the crux of the task and social dimensions of all groups.

The decision-making group is undoubtedly the most familiar of all task oriented groups in our society. Some authorities view even the family as a decision-making group<sup>1</sup>. Group decision-making is indeed an extremely common occurrence in the day-to-day life of every member of our society. Moreover, group decision-making is vitally important to the functioning of every human

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<sup>1</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 10

organization. Whether the organization functions effectively or ineffectively, group decision-making governs every facet of its existence. Our concern, naturally enough, is effective group decision making. And prerequisite to effective group decision-making is a thorough understanding of the basic process of group decision-making. The need for a comprehensive knowledge of group decision-making is obvious in order to analyze and find effective solutions for its ills plaguing our society. The solution to every social problem- crime, poverty, inflation, unemployment, denial of human rights- is ultimately dependent on effective decisions made by groups concerned with and able to cope with those social ills. And effective decisions demand an understanding of effective decision making<sup>2</sup>.

Decision making at every level of society cries out for substantial improvement. We still endure the tragic results from past decisions. Something is tragically wrong with those management decisions made or not made, implemented or implemented badly. While an understanding of group decision making will not miraculously cure all social problems, it is at least a step, however small, in the appropriate direction. Understanding the nature of group process requires an understanding of the nature of "group and process" separately. Process involves the dynamic relationships of events in an ongoing, continuous sequence of time. Each ingredient of the process affects and is affected by every other ingredient as changes in the process evolve through time. A collection of individuals develop "groupness" over time so that the identity of a group exists apart from the identities of its individual members. A group is conceived to be a system characterized by its structure (the pattern of relationships among components at any given point in time), its function (the regulatory recurring day-to-day relationships among components through time), and its evolution (the

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<sup>2</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 11

continuous evolutionary changes of structure and function through enduring time)<sup>3</sup>. Rather than perceiving individual members as components of the group-system, we should consider communicative behaviors as the units for defining, observing, and analyzing the group-system. Thus, a group is a collection of individuals whose communicative behaviors- specifically, acts, interacts, and double interacts-become interstructured and repetitive in the form of predictable patterns.

**B. Dimensions of the Group Process:**

Both the task and social dimensions are inherent in the process of group decision making. No decision-making group exists without both dimensions, each of which is vitally important in order to understand effective group decision making. The task dimension refers to the relationship between group members and the work they are to perform- the job they have to do and how they go about doing it. The social dimension includes the relationships of group members with each other and the abouts of their membership in the group. Group members make a decision and develop ideas at the same time and in the same manner that they develop a group structure and get along together.

Despite the difficulties of observing and measuring productivity and cohesiveness, they serve as useful concepts to describe the general success of a group along its task and social dimensions. Caution must be exercised, however, in utilizing these descriptive terms. "Cohesiveness" and "Productivity" are not qualities which a group does or does not possess<sup>4</sup>. Each is a characteristic which describes to some degree the success of the group process in every group.

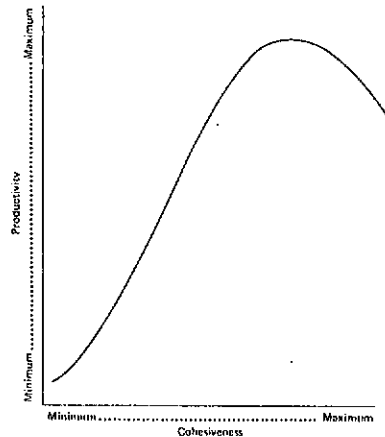
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<sup>3</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 26

<sup>4</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 36

Productivity and Cohesiveness may be considered the outputs of the task dimension and social dimension respectively. A curvilinear relationship exists between task and productivity so that as the cohesiveness of a group increases up to a point of diminishing returns (figure 2-1).

**Figure 2-1:**



As a group approaches extremely high cohesiveness, it tends to decrease its productivity. Thus, the group with highest productivity is generally a group with only moderately high cohesiveness<sup>5</sup>. Consistent with the interdependence of the task and social dimensions, productivity and cohesiveness are also interdependent, each exerting influence simultaneously upon the other.

Surely the process of making decisions in a group differs from that of an individual working alone. A group is different from a single individual. For one thing, there are more people in a group. A group involves a greater variety of resources. There are more minds to contribute to the decision-making effort as well as more sources of information. Unlike the lone individual, a group is able to divide labor among its members, having one individual work on his specialty, another working on another specialty, and so on. On the other hand, a group suffers potential problems not inherent in individual decision making. The problem of achieving consensus is present in a group, and with the addition of more people

<sup>5</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 34

there is greater opportunity for conflict. However, a critical exchange of ideas is much more easily accomplished by a group. A vast quantity of investigation have compared individual decision making with a group decision making<sup>6</sup>. While the group process embodies two dimensions (task and social), the individual process has only the task dimension. The two-dimensional nature of groups results in several points of comparison with individuals. Groups tend to make riskier decisions than do their individual members making decisions alone. And, compared to individuals, groups are inefficient and slow. But for many situations, group decisions are virtually necessary because of the superior quality of the decisions. There are some tasks which can just as easily be performed by individuals or groups. For those tasks group activity adds nothing to the efforts of the most capable member. These tasks are those whose accomplishment requires high-quality technical expertise and for which there is one "correct" or "best" answer validated by the subject matter of the technical specialty. Other tasks, however, require group acceptance or group commitment for successful performance. For such tasks no single answer may be externally validated as "best". The sole means of validating this type of decision is whether it achieves consensus. These situations comprise the type of task which may be uniquely labeled, the group task. A group decision, because of the "assembly effect", will undoubtedly be superior to the decision made by even the most competent group member working individually<sup>7</sup>.

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<sup>6</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 43

<sup>7</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 74

### C. Leadership & Status:

It would be good to shed some light on leadership in a small group, specifically how leadership develops in the small decision-making group. People commonly consider leadership to be embodied in a person occupying a given position in the group. Therefore, a leader is a person first and a position in a role network second. While this view point is a common one, it may have hindered progress in discovering the nature of leadership. In order to enrich our understanding of this elusive phenomenon, an evaluative survey of the most common perspectives on leadership follows.

The early approach to leadership searched for those individual characteristics or traits which leaders possess. The traits approach attempted to distinguish leaders from non-leaders on the basis of how they differed on personal character<sup>8</sup>. A list of some traits, such as dependability, intelligence, self-confidence, enthusiasm or dynamism, originality, responsibility, verbal facility, critical thinking ability, and creativity, appears to be consistent with common sense. One would normally think that a leader should possess all these traits. But the traits approach to observing leadership has failed to achieve consistent results. Indeed, a leader of one group does not consistently achieve leadership in other groups. In fact, the leader often cannot maintain his leadership even in the same group. Virtually no one today considers the traits approach a satisfactory explanation of leadership<sup>9</sup>. In addition to the fact that no trait has been consistently associated with leadership, there are other reasons for finding this approach less than satisfactory. First of all, personality is an elusive phenomenon.

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<sup>8</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 75

<sup>9</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 76



No one has been able to determine successfully the specific components of personality. A second reason for rejecting the traits approach distinguishes between achieving leadership and maintaining it. Perhaps most important of all, the traits approach cannot differentiate between a good and a bad leader. The traits approach goes only so far as to distinguish leaders from non-leaders and is inherently incapable of distinguishing good or effective leadership or drawing any sort of distinctions among leaders.

The styles approach proceeds from a different perspective. This approach seeks to determine which style of leadership is best or most effective in a group by comparing one predetermined style with another<sup>10</sup>. The early research utilizing the styles perspective differentiates among three general styles of leadership. Those three styles were generalized descriptions of the relationship between the leader and his followers based on the leader's general pattern of behavior- democratic, autocratic, and laissez faire. The latter style of leadership was soon discarded because it was so difficult to define. Those in business management commonly refer to the two styles as participatory and supervisory management styles. The styles approach also is not a satisfactory perspective from which to view leadership in a small decision-making group. It is intuitively obvious that one style is not most desirable or most effective for all groups and all situations.

Due to the inability of the traits and styles approaches to provide robust explanation of group leadership, many have turned to other perspectives. Today the situational approach is by far the most popular and common perspective of group leadership<sup>11</sup>. The situational perspective describes the person who rises to

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<sup>10</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 76

<sup>11</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 77

the leadership position with emphasis on discovering the appropriate person for the appropriate situation. Less consideration is given to what the leader does or what he needs to do for effective group functioning. The situational perspective of group leadership may be a compromise between the traits and the styles approaches, but it seems to be little more than a "cop-out" in order to explain the inexplicable. Finally, the functional perspective, unlike any of the other three, focuses on the communicative behavior of individual members which contribute to group progress. The perspective de-emphasizes leadership as the person who occupies a given position in a network of roles.

Since all groups face problems of accomplishing tasks and maintaining satisfying interpersonal relationships, the group's effectiveness is dependent on how well leadership functions are fulfilled. Leaders, like groups, vary in their characteristics. Different situations and circumstances require different functions to be performed if a group is to move closer to its goals. Leadership is viewed as a role that provides for vital group needs by exerting influence toward the attainment of group goals. Leadership, according to this definition, is a process. It is present no matter who the individuals taking leadership roles or what their influence. The leadership functions related to task accomplishment include helping set and clarify goals, focusing on information needed, drawing upon available group resources, stimulating research, maintaining orderly operating procedures, introducing suggestions when they are needed, establishing an atmosphere that permits testing, rigorously evaluating ideas, devoting oneself to the task, attending to the clock and the schedule, pulling the group together for consensus or patterns of action, and enabling the group to determine and evaluate its progress.

The group-maintenance functions of leadership include encouraging participation by everyone in the group, keeping everyone in a friendly mood, responding to the emotional concerns of group members when that is appropriate, promoting open communication, listening attentively to all contributions, encouraging with positive feedback, showing enthusiasm and good humor, promoting pride in the group, judging accurately the changing moods of the group, and providing productive outlets for tensions<sup>12</sup>. The performance for both task and maintenance roles, then, is essential if a group is to move toward its goals. To some degree, all good group members help in fulfilling these necessary leadership roles.

The quality of the leader-subordinate relationship should be stressed as an important determinant of productivity, morale, and other goals desired by the group. Studies show that the leader follower interaction will differ markedly in productive and non-productive groups<sup>13</sup>. Contrary to what one might expect, the leaders or supervisors of highly productive units do not appear to devote their greatest time and efforts to technical or job-oriented functions with their subordinates. Rather, the leaders whose subordinates show the best performance records focus their primary attention on the human aspects of their relationships and attempt to build work groups with high-performance goals. They tend to spend more time than their low-production counterparts in motivating their subordinates, providing them with structure, keeping them informed with what is going on, getting their ideas and suggestions on important matters before going ahead, training them for more responsibilities, trying out new ideas with them and, in

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<sup>12</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 55

<sup>13</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 60

general, showing consideration for the followers and their needs. The low-production leaders, on the other hand, frequently demand more from subordinates than they do, criticize them in front of others, treat them without respect for their feelings, scold them for making mistakes, initiate actions without consulting them, and refuse to accept their ideas and suggestions or even explain the actions they, as leaders, have taken.

#### **D. Social Conflict & Deviance:**

Realistically, social conflict and deviance are so common to the process of group development, they are considered normal within the group process. A decision-making group invokes social conflict as members test ideas in a critical exchange of information and opinions. Coalitions form temporarily around conflicting ideas before typically merging as the group achieves consensus. And the leader, paradoxically enough, normally conforms to and deviates from group norms in the process of gaining and maintaining his leadership status<sup>14</sup>.

#### **E. The Decision-Making Process:**

Preliminary to the ensuing discussion of the group decision-making process is a full understanding of several key terms which will be used extensively in this research. The relationship between "decision-making" and "problem-solving" is not a source of universal agreement. Some view the two terms as virtually synonymous; others draw rather clear distinctions between them. For us, we should be certain that decision making includes some types of problem solving and much more. A *decision*, ultimately the outcome of group interaction, is inevitably

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<sup>14</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 101

a choice made by group members from among alternative proposals available to them. Rarely, if ever, does a group make a single decision in isolation. Group members, then, focus their attention on various proposals during their interaction and choose from among those alternative proposals which they will accept or reject. The sum of those proposals accepted constitutes the productivity of the group. Although quantity of proposals initiated during group interaction is not a reliable measure of productivity, the fact remains that only those proposals which are initiated during interaction are available for final decision making<sup>15</sup>. A group reaches a decision as members achieve consensus on a proposal. The term consensus lies in the degree of personal commitment the members feel toward the group decision after it is reached. This means, for example, that even though some members might disagree with the decision on principle, they will accept it and personally carry out their part. This emotional commitment to the group is measured by willingness to put the plan decided on into effect, in their own personal behavior. Simple agreement on a decision proposal, then, does not necessarily guarantee that the decision has achieved group consensus. In fact, group members who submit to pressures or external authority might express agreement without really accepting the proposal itself.

There are two distinct though common approaches to the group process of decision making- each with limitations as well as advantages. The "prescriptive" approach attempts to illustrate how groups should make decisions. The "descriptive" approach attempts to document how groups do make decisions<sup>16</sup>. As the name implies, the prescriptive method provides guidelines, an agenda, a road map to assist a group in achieving consensus. As its name implies, the descriptive method involves the observation of actual groups engaged in social decision

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<sup>15</sup> B. Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 128

<sup>16</sup> B . Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 130

making and seeks to describe the process which is common to all groups observed. While the prescriptive method is based on an "ideal" process, the crux of the descriptive method is the "reality" of observation.

Prescriptive approaches to group decision making rest on several inherent assumptions. First, prescriptive methods typically assume all members to be consistently rational. The prescriptive method warns against emotional appeals or other non-rational aspects of group interaction, assuming that such techniques disrupt efficient group decision making. In other words, prescriptive methods often distinguish clearly between the task and socio-emotional dimensions of the group process and assume the latter to be disruptive. A second assumption underlying prescriptive methods of group decision making is an attempt to improve the quality of the group's decision making outcomes. Similar to a physician's prescription of medicine for an ill patient, prescriptive group methods assume that using the method will lead to a happy, healthy, and productive group. Undoubtedly the most common prescriptive method used in group decision making is the "reflective thinking" model suggested by John Dewey<sup>17</sup>. Dewey's model includes the following six steps:

- Step 1 : A difficulty is felt or expressed
- Step 2 : The nature of the problem is defined
- Step 3 : The nature of the problem is analyzed
- Step 4 : Possible solutions are suggested to solve the problem
- Step 5 : The solutions are compared by testing each against selected criteria, and the best solution is selected.
- Step 6 : The best solution is implemented, that is, put into effect.

Dewey's model serves as a universal agenda to guide a group toward consensus in an orderly, and step-by-step progression. The group is expected to discuss and complete each step before moving to the next step in the sequence.

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<sup>17</sup> B . Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 131

Steps are intended to be followed in sequence without omitting any or reversing their order. A second prescriptive method, developed by the United States Navy, known as Program Evaluation and Review Technique (PERT) is worth mentioning. PERT is a detailed method which embodies only one of the steps in Dewey's reflective thinking model- number 6. Because it does not further any understanding of how groups achieve consensual validation of their decisions, the various steps of PERT are not included here.

Several assumptions also underlie the descriptive approach to group decision making. Probably most basic is the assumption that a "natural" process of group decision making exists<sup>18</sup>. That is, groups develop their interdependent task and socio-emotional dimensions in a normal, fairly consistent pattern leading to consensual validation of decisions. The natural process of group decision making, of course, is present to the extent that a group is free to develop its own task and social dimensions for itself without undue influence on the group imposed by some external source. The most familiar of all descriptive models of the group process is the three phase model advanced by Bales<sup>19</sup>. His three phases may be briefly illustrated as follows:

- Stage 1 : Emphasis on problems of orientation (deciding what the situation is like)
- Stage 2 : Emphasis on problems of evaluation (deciding what attitudes should be taken toward the situation)
- Stage 3 : Emphasis on problems of control (deciding what to do about it)

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<sup>18</sup> B . Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 132

<sup>19</sup> B . Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 132

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Bales analysis of the group decision-making process indicates that members predominantly give and ask for orientation in the first phase, give and ask for opinions in the second phase, and give and ask for suggestions in the third phase. Bales also emphasizes the cyclical nature of the three phases of group decision making. As a group completes one decision making task by progressing through the three phases of orientation, evaluation, and control, the group tends to recycle back to the initial orientation phase as they perform each subsequent task.

Groups do not “select” leaders so much as the leader and other roles “emerge” during group interaction. If the task and socio-emotional dimensions of group process are truly interdependent, it seems reasonable that the decision-making process should be similar to the leadership process. Moreover, group decision-making, like leadership, possesses no single “best” or correct answer to be discovered in a “Eureka” or “Aha!” manner. It is reasonable to conclude that groups do not make decisions. Decisions emerge from group interaction. The observed pattern of communicative behaviors- acts and interacts- indicates four rather distinct phases of group decision making, each characterized by a different pattern of interaction. Those phases are labeled Orientation, Conflict, Emergence, and Reinforcement<sup>20</sup>.

**E.1. Orientation Phase** : A group’s early problems of socializing and excessive primary tension affect the interaction patterns in this early phase. As each member is unaware of his social position initially and not sure of how to handle the task, he does not quickly or strongly assert himself or his opinions. Consequently, he makes assertions tentatively in order to test the group, and he agrees with virtually everything. Characteristics of the Orientation Phase, then, is getting acquainted,

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<sup>20</sup> B . Aubrey Fisher, Small Group Decision Making, Mc. Graw-Hill, Inc., New York(1974), p. 140



clarifying, and tentatively expressing attitudes. This stage is a period of forming opinions, not rocking the boat, and getting rid of social inhibitions.

**E.2. Conflict Phase** : The second phase of group decision making is characterized by dispute- ideational conflict over decision proposals. Members appear to have made up their minds. They are aware of the direction the group is taking toward their decision-making task and of the relevant decision proposal, which are emerging from the group deliberations. Thus, members typically express either a favorable or an unfavorable attitude toward those decision proposals. Gone is the tentativeness or ambiguity. Gone, too, is tentativeness due to social inhibitions. The interaction patterns of the Conflict Phase reflect the formation of two coalitions formed from polarization of beliefs. That is, two coalitions are present in the Conflict Phase- one favoring and one opposing those decision proposals which ultimately achieve group consensus.

**E.3. Emergence Phase** : Social conflict and dissent dissipate during the third phase. Members express fewer unfavorable opinions toward decision proposals. The interaction patterns in the Emergence Phase reflect significantly less positive reinforcement of each other's unfavorable attitudes. Opposing members typically assert unfavorable opinions without including supporting evidence or reason to substantiate them. Ambiguity toward decision proposals is prominent in the Orientation Phase, declines significantly in the Conflict Phase, and rises again during the Emergence Phase. In this phase members have no reason to be tentative. They are certainly no longer searching for attitude direction. They plotted that direction in the Orientation Phase and disputed it during the Conflict Phase. In the Conflict Phase members either favored or disfavored the decision proposals. In the Emergence Phase the bimodal distribution has shifted to favorable or ambiguous attitudes towards the same proposals. So, a member's opposition in the conflict

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phase is dissipating as he modifies his own attitudes in the Emergence Phase. The third phase is probably the crucial stage in the group process of decision making. During the third phase the eventual outcome of group interactions becomes increasingly more apparent.

**E.4. Reinforcement Phase** : While group members tend to reach decisions during the emergence phase, they achieve consensus on those decisions during the Reinforcement Phase. Substantiating one's opinion towards the decision proposal is no longer necessary in this final phase. After all, the ideas were thoroughly tested during the Conflict Phase, but members continue to provide evidence and reasons to support their opinions favoring the decision proposals, thus adding additional fuel to fire of emerging consensus. Members constantly and consistently express opinions favorable to the proposals and positively reinforce each other's favorable opinions with expressions of agreement. Dissent has all but vanished in the Reinforcement Phase. Pervading this final phase in group decision making is a spirit of unity. All members seem to agree and strive to show that agreement through positively reinforcing each other.

Group Decisions achieve consensus in a spasmodic and cumulative modification of decision proposals in which proposals are introduced, discussed, dropped, and reintroduced in slightly modified form until the proposal appears in a form which achieves group consensus. Although this start-and-stop process of decision modification is typically of all introduced decision proposals, the presence of social conflict affects the pattern of reintroduced decision proposals and the members' perception of the group task. In every case, the spasmodic process of decision modification reflects the normal interaction patterns of group members and influences both group's task and socio-emotional dimensions.

## **II. Decision-Making Group Interaction**

### **A. Interpersonal Behavior in Groups**

People spend a great amount of their lives in groups of various sorts- the family, friends, teams, work groups, and so on- but rarely do they take the time to stop and observe what is going on within the group; what do the members' behaviors mean?

A primary reason for people's meeting and forming a group is to accomplish some publicly stated and agreed-upon task. This advertised business is often called the agenda, the purpose for which a group meets. If the task is clear, the procedures established, the leader competent, and the members committed, it would seem that the group would work logically and progressively to an intelligent consensus. We all know, however, that groups do not always follow logical, progressive patterns to intelligent conclusions. Harsh feelings, emotional harangues, irrelevant issues, and factional squabbles impede progress and distract from the task to be accomplished. Such indirect problems of behavior are manifestations of what have been called "hidden agenda". The latter may be a real barrier to group productivity. Each member should recognize that the group is always working on two levels at once and be able to diagnose what the genuine problems are. Sometimes it is desirable to get the hidden agenda to the surface; at other times they are best ignored. There can be no substitute for sensitivity and good judgment<sup>21</sup>.

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<sup>21</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 31

### **B. Role Functions and Performance**

Whenever people interact and face a common problem, there is likely to be much interest in one another's words and actions. A study of role performances refers to ways in which group members perceive and characterize one another. The individual has a role only through his interaction with others; therefore a role is a product of the interaction process rather than individual attribute. When we enter a new group we start looking for cues to direct our behavior. We make systematic decisions to behave in a given way in a certain situation. The frames of reference that provide cues include four factors: Our personality traits, the social situation, the group process requirements, and the behavior patterns of others<sup>22</sup>.

**B.1. Personality Traits** : The personality traits of an individual may be the basis of his inclusion in a group. Groups that limit their membership, particularly elected bodies, are dependent upon perceptions of personality traits and behaviors prior to any group interaction. Reputation and stereotypes make other members of the group expect certain things. A "warm", "decisive", "supportive", "cooperative", "bright" individual is likely to be welcomed in most groups. These traits then become the initial basis for expectations of the group.

**B.2. The Social Situation** : In decision-making groups there are likely to be rituals as role expectations. Parliamentary rules and bylaws are designed to provide guidance for member behavior. The roles of chairperson and secretary are often clearly defined. Formality of procedures provides limits to spontaneous

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<sup>22</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 46

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interaction. The degree of formality probably will be tied to such variables as the number of people present, the time available, and the history of the group.

**B.3. Group Process Requirements:** An individual is likely to play one role and then another, depending on the requirements of the group. An effective group without recognized leader will still have the leadership functions filled by various members. The requirements of the group call for changes in the role expectations of group members.

**B.4. Behavioral Patterns of Others :** An individual's definition of the social situation and his own self-concepts will affect his response. If our boss tends to dominate a meeting, we probably shall submit; but if a peer does so, we might respond competitively. In a continuing group almost all persons manifest certain role patterns that they automatically assume in response to the other members.

**C. Group Characteristics and their Effects:**

1. **Norms and Conformity:** The concept of group norms identifies the ways in which members of a group behave and ways that are thought by them to be proper. If people are to be able to interact, they must have some areas of agreement around which to organize their attitudes, values, perceptions, and cognitions. In the absence of some norms no stability or orderliness is possible, and chaos will result. Cooperation presupposes some basis of mutual agreement. The observance of norms results in conformity. Conformity extends from overt behaviors to perceptions and attitudes. How do these group norms emerge? We might suggest two ways. First, people seek to validate their beliefs; if their beliefs cannot be verified by checking facts personally, then what everyone else believes must be true. Second, if a group is to survive and be effective, interactions among the

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members must be coordinated. Norms regulating the conduct of the members are, therefore, instrumental to the survival and success of the group. Norms vary in the ease with which they can be learned. Some are formally codified, as in bylaws; others may be easily recognized and verbalized by members; others are less explicit and become apparent only when they are violated.

2. **Cohesiveness:** Conformity may be thought of as an individual's adherence to group expectancies. Similarly conformity is greatest when a group is cohesive. The two dimensions are interdependent and closely related. Cohesiveness refers to the overall attraction of group members to each other and the way in which they "stick together". Indirectly, cohesiveness refers to the morale, teamwork, or so-called group spirit of the group, other things being equal, as cohesiveness increases there is an increase in a group's capacity to retain members and in the degree of participation by members in group activities. The greater a group's cohesiveness the more power it has to bring about conformity to its norms and to gain acceptance of its goals and assignment to tasks and roles. Finally, high cohesive groups provide a source of security for members which serves to reduce anxiety and to heighten self-esteem.

3. **Commitment to Task :** People are committed to the group task when they conceive and accept the group goals; commit their personal resources, skills, intelligence, and energy toward accomplishing it; and give its accomplishment higher priority than their own goals, the group's norms, and the existing pattern of interpersonal relationships among members including their own popularity and personal comfort.

4. **Group Size** : Quality of the interaction varies with group size. As group size increases, the index of inhibition decreases, and as members become better acquainted through the course of the meetings, the inhibition levels drop more for the larger group than for the smaller. In the larger group physical freedom is restricted while psychological freedom is increased. The member has less time to talk, more points of view to integrate and adapt to, and a more elaborate structure into which he must fit. At the same time he is freer to ignore some of these viewpoints, to express his own feelings and ideas in a direct and forceful fashion, and even to withdraw from the fray without loss of face.

**D. Conflict and its Resolution :**

Conflict typically involves some obstacle to achieving a desired goal; it often arises when someone has a chance to win at the expense of someone else. Competition in a game or a particular job exemplifies this type of conflict. Yet it does not take two to quarrel, sometimes we are in conflict with ourselves. One obvious way of removing conflict, its consequent frustration, and increased tension is to make choices among the alternatives. Sometimes the choice is an absolute one; in other cases the person decides to attain this goal first, and later that one. In either case the increased tension helps to force a choice- and choice in conflict situation is adaptive behavior. The tension has brought about a redefining of the situation, so that the conflict is eliminated<sup>23</sup>.

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<sup>23</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 77

There are numerous sources of internal group conflict. Any perceived changes, ranging from leadership roles to group structure to activities to new membership, may provoke conflict. Whether we are aware of it, our future goals and fortunes are greatly affected by states of harmony or conflict between groups. Between groups sustained conflict over mutually desired goals attainable to only one group provokes hostile and aggressive acts, social distance, negative stereotypes, and also internal group solidarity and changed relationships. Establishing superordinate goals provides a framework of cooperation among the rival groups and effectively reduces the negative conflict. Conflict, whether at the individual, the group, or the inter-group level, has a potential for both functional and disruptive consequences. At the individual level internal conflicts may be viewed as dissonance problems. One way of minimizing the discomfort that people experience when they find themselves doing something inconsistent with their attitudes is to modify those attitudes. Another way of minimizing discomfort is by reconciling discrepant judgments. In a group situation this approach forces individuals to look for good reasons that rationally account for the disagreement in such fashion as to allow them to accommodate both their judgment and that of the group. Thus they may decide that the question asked actually could be interpreted in different ways, leading to different and equally correct answers. This form of cognitive reconciliation obviously makes it easier for individuals to stick to their own judgment. Within a group, conflict can best be handled through open communication based upon mutual trust. The optimum norm would allow free expression of feelings but would require that the expressions be treated as data and processed as is the other data related to the group task. Thus the individual may express himself, but he is forced to think twice. If he does not concern himself with how his feeling relates to what is going on in the group, he can be sure that others will do so. This does not imply prosecution or justification; it means that



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the group and its individual members accept responsibility for understanding and processing all the relevant data at their disposal<sup>24</sup>.

Many have been somewhat dismayed at the lack of sensible, logical progression on the part of the real-life decision making groups that were observed. Disturbing as it may seem, such practices are fairly common practiced in society. This is probably true because no person or group of persons can easily identify and evaluate all the possible interpretations and solutions to a given problem until what appear to be certain essential points have been covered more than once. One reason for this is the lack of human ability to grasp all the related parts of a complex problem without inadvertently focusing on some of them more than once. A second explanation is that some people see specific relevant parts, but for one reason or another do not verbalize them to the group at a logical time, but at a later time. A third reason may be that some possible interpretations of the nature of a problem are not perceived by any member of a group until a certain alleged solution to the problem is explored in depth.

#### **E. Phases of Interaction:**

Although more than one study indicates that decision-making groups do not ordinarily move in a logical straight line from problem identification to its solution, however an attempt will be made to present a more or less logically desirable sequence of procedural steps. As a matter of fact, a neat arrangement of sequential events is not the way in which many groups work, although a study presents some evidence that task groups show the following phase-sequential behaviors in dealing with problems<sup>25</sup>:

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<sup>24</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 86

<sup>25</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 108

- A search for information or orientation on the selected problem
- Attempts to evaluate the situation and identify proposals for improving it
- Exploration of ways of controlling group members' behavior regarding the situation, that is, attempting to reach a group decision on a plan of action.

The evidence that groups use a logical pattern of progression in a problem solving is indefinite, and research evidence that such a pattern facilitates effective problem solving is notably lacking. However, essays and textbooks over at least the last two generations have advocated such a pattern. It seems that when people are in trouble, such a pattern of interaction makes logical sense even though many real-life group discussions do not follow such a pattern; frequently they overlook or omit one phase or another<sup>26</sup>.

It is suggested that one of the main difficulties faced by groups is their inability to arrive at a common understanding of the decision issues; that is, difficulties in group decision making may stem from a failure to find and adopt a shared frame of reference for viewing the group's progress toward reaching a decision.

### **E.1 Identifying a Common Problem:**

It is extremely important that members of a group check with each other on the nature of each individual's concern before they begin to try to find a solution to the problem. All further task oriented behavior is guided by an understanding of a mutual concern. It is then when group cohesiveness may be increased and

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<sup>26</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 110

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tolerance of personal differences in viewpoint may be enhanced. To solve a problem, the first step clearly is to gain an understanding of the problem. Without this step confusion can easily frustrate a group. The place to start identification of a mutual concern in a group is for all members to state clearly their personal needs regarding the topic area. They should start with tentative, trusting behavior, clearly stating their personal view of the situation and how they feel about it. At this stage, their interpersonal manner, way of stating their viewpoint, and attitude toward other members can indicate a good, or poor, understanding of this phase of the decision making process. Viewpoints must be stated clearly and honestly. If honesty prevails, it will become apparent whether a group can work well together on the problem previously thought to be of mutual concern.

In any event, to assume that concerns of the group are shared by members of other groups is indeed risky business. No one ever perceives another or feels towards him exactly the way the latter perceives or feels toward the first, and of course small differences may not be important. But the first step in determining the mutuality of concern between groups is to determine how he or his group is perceived and how members of other groups feel toward him. One may at times discover that he and the other members of his group simply do not share a mutual concern: he and others see a situation or process in different ways. In determining the complementarity between his goal and the goals of other members of his group the question of capability must be raised. Are the other members of the group actually capable of helping him achieve his goal? Can he actually help them achieve their goals? If so, and if the perceived costs for him (and them) are less than the perceived values of possible rewards (for both him and them), then he may proceed to work together on that basis, both he and they working toward the achievement of complimentary goals. This basis for group interaction is a bit more complex than it is when members can clearly identify a mutual concern;

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consequently, complementary concerns should be verified with care and estimates of probable costs and rewards given careful attention.

So, the primary point to be learned is that one should not assume that he and other members of his group share a mutual concern about an alleged problem area or situation rather, he should carefully determine the actual degree of shared concern.

### **E.2 Analyzing a Problem:**

The identification of mutual concerns is general in its approach, and only broad problem areas are identified. Although the concerns thus identified are broad and not specific, this identification is imperative for two reasons: It increases the feeling of cohesiveness in the group, and it reduces the possibility that members will behave in a defensive way, that is, a way that diminishes open, frank expression of their personal concern regarding the problem area.

As a group attempts to set a group goal, there are specific procedures that can facilitate the effort. The most useful procedure is to compare what exists with what is desired. By definition, a problem consists of a situation or condition in which what currently exists is not what you prefer. In its simplest terms the process of problem analysis consists of determining the difference between what you have and what you would like to have. However, the determination of this difference can be difficult and complex procedure when it is performed by a group; varying personal views of the difference may be voiced, most of which have at least some real merit. Each of these personal views must be clarified, understood, and evaluated to form the best possible group perception of the problem.

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To analyze a problem, we need first to determine its scope. How large is it? How many people are involved? How many forces are at work? Are social, economic, and political forces involved? Or is it a matter of obtaining a little more money? It has been observed that disagreement among group members more frequently occurs regarding the degree of intensity of a problem than on the facts of the situation being considered<sup>27</sup>.

Much difference exists between sharing a mutual concern and defining a group goal. The primary difference is the degree of specificity. When a group sets a goal, it should be specific enough so that members will be able to tell when it has been achieved. As the group works on the identification of a specific goal, it will become apparent that what is exactly the concern for some members is not exactly the concern of other members. As members attempt to clarify the area of primary group concern, they must be prepared to make minor adjustments and compromises with each other in order, eventually, to adopt a goal that meets the concerns of most and to which all members can make a functional commitment.

Almost the last thing we should do in analyzing a problem is get the facts. Relevant facts in any given situation will be determined in part by a thorough analysis of impelling and constraining forces. Getting "the facts" too soon, that is, without complete consideration of these forces, can produce a lopsided view of a problem. In addition, group members' value systems will determine some facts to be relevant and some not directly related to the problem as they see it. Checking out the value system of different members can help to identify different types of factual information seen to be relevant by the group members.

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<sup>27</sup> Bobby R. Patton, Decision Making Group Interaction, Harper & Row Publishers, New York (1978), p. 129

### **E.2.1 Barriers to Problem Analysis**

There are certain common pitfalls in group problem analysis that help account for the difficulty that many groups have in reaching an agreement. Four assumptions, that often lead to trouble in problem analysis, are frequently held by persons in our culture and must be identified, evaluated, and abandoned if group members are to analyze problems in a functional manner:

1. Too early emphasis on possible situations
2. Lack of specific information
3. The assumption that truth will emerge
4. Confusion between disagreement and dislike.

### **E.3 Evaluating Proposed Solutions:**

#### **E.3.1 Brainstorming:**

Decision Making involves the evaluation of various proposals, the selection of one, plus the identification of all possible proposals. The steps followed to evaluate proposed solutions are two fold: to identify the possible approaches to the problem and to evaluate the proposals by comparing each one with the others. For the first step, **brainstorming** is recommended. The primary objective of this technique is to free group members temporarily from inhibition, self-criticism, and criticism of others, in order to produce more imaginative alternative approaches to a specific problem. The problem should be carefully specified and all evaluations withheld. The use of brainstorming in groups increases the production of valuable ideas. It is superior to patterns in which critical evaluation is not delayed, in that

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the total number of ideas is greater, and that, as the quantity of ideas is increased, the number of valuable ideas is increased proportionately. The brainstorming technique should not be used until a problem has been defined: uninhibited creativity combined with ambiguity can produce a general sense of confusion. In addition, a group should recognize fully well that uncovering a lot of good ideas does not eliminate the need to evaluate them later in order to select the best one. Careful evaluation of alternatives must always follow a brainstorming session.

It is agreed upon that a 20-to-30-minute brainstorming session can be not only profitable to a problem-solving group but a lot of fun. There is a sense of freedom from ordinary restraints, the challenge to think of something novel or new, the excitement of discovery, and the good-natured, temporary acceptance of apparently ridiculous suggestions. In many ways a brainstorming session can inadvertently satisfy a need to increase group cohesiveness at a particular time when a problem-solving group may be tempted to split into factions supporting pet solutions to a serious problem.

### **E.3.2 Using the Results of Brainstorming:**

After a large number of suggestions, sometimes as many as a hundred, have been presented, there is nearly always the need to clarify many of them. This clarification process will need to be carried out when all group members are present. In many cases a suggested alternative can be modified, added to, or otherwise enhanced by a person other than its original author. Creative thinking, once started, should be encouraged and continued. Overlapping ideas and suggestions should be compared, sorted, and explored for their full potential. In many cases the best ideas may actually be combinations of other ideas. No idea

should be abandoned immediately just because it is apparently ridiculous; it should be given careful and serious consideration to realize its possible potential.

It is often one thing creatively to uncover a valuable idea; it is frequently quite another to put it into operational terms, to *represent* it in such a way that it can be implemented. Operationalizing a suggestion that is somewhat vague, or abstract, may take as much group effort as did the original brainstorming session in which it first appeared. Even so, it has to be done before its real potential can be assessed. This requirement brings to light an inherent problem. Can this kind of group time be devoted to hundred possible approaches? Of course, the answer is no. The group should attempt to consider as many as possible; however, if it operationalize and consider five potential solutions, it will have more than doubled the chances many groups give themselves for finding the best solution to a problem.

### **E.3.3 Evaluating Proposals:**

In evaluating various suggested approaches, or plans of action, the group will be interested in achieving two objectives: Choosing that proposal which will be most satisfactory for the group and obtaining members' agreement and commitment. This group commitment eventually will be necessary if you are to implement the chosen solution and make it work in the way it is envisioned. Three basic criteria can be used to evaluate any proposed plan of action:

1. Will this proposal produce the desired changes in the current situation? Will it meet the need for change as we have identified it?
2. Can this proposal be implemented by us? Is it a workable suggestion?
3. Does this proposal inherently contain serious disadvantages?



The first criterion requires the group to go back to the results of its force-field analysis and compare its impelling and constraining forces with the actual changes suggested by the proposal. Any proposal that changes a number of significant impelling and constraining forces will be evaluated as more desirable than a suggestion relating to only one of these forces. Thus each proposal must be evaluated in terms of its probable effect on each of the compelling and constraining forces earlier identified.

The second criterion is crucial and frequently neglected by decision-making groups. It is crucial because, if a proposal cannot be implemented, it is not practical. Care should be taken that suggestions are not branded impractical without being given careful thought and consideration; sometimes plans that are new to a group are too early called impractical. However, eventually a proposal must be possible of implementation if it is to be of real value.

The third criterion requires to look for inherent dangers or severe costs to the group. Inherent dangers usually consist of risks that the group cannot afford to take. The costs are judged to be unreasonable if they are greater than the benefits derived from the adoption of a given proposal or greater than the costs of alternative proposals that can achieve the same results.

#### **E.4. Implementing a Decision:**

After decision-making group members have reached agreement on the appropriate or best solution to a problem of mutual concern, they will need to give special attention to putting that solution into operation. A chosen solution does not ordinarily become operative just because it is approved by a group: individual

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group members must make sure that it is actually put into practice. The first approach to decision implementation is “developing a detailed plan of action”. In essence a detailed plan of action is one that organizes the efforts of the members of the group. The objective is to arrange for the most capable member to do a needed job at the most appropriate time with the necessary equipment or material.

Detailed planning starts at identifying specific steps to be accomplished. As the list of steps to be taken is completed, the group needs to identify equipment, machines, material, and other resources needed in each step. Arrangements should so be made that at the appropriate time and place the required resources will be available. If there is high commitment to the proposed plan of action, the group members should find it fairly easy to assess individual interests and capabilities. General group agreement should be obtained as individual responsibilities are determined; in essence, the individual’s responsibility should be to the group, not to one or two of its members or to himself or herself alone. Accidents occur, unforeseen barriers are encountered, and some persons become ill or find that their capabilities were overestimated. The overall plan should provide for such unforeseen emergencies. Finally a plan for evaluation of the proposed plan should be adopted.

The second approach, namely “mobilizing external resources”, is highly recommended when the group faces a problem that cannot be solved through the efforts of the group members; a need for the help of persons outside the group arises. The group problem should be redefined as a community or social problem. The first step is to follow standard procedures of group problem solving: meet with other concerned persons, identify clearly this mutual concern, analyze impelling and constraining forces, identify the possible approaches, evaluate the suggested alternatives, and develop a detailed plan of action. Then, the support of those

outside the group should be gained. This can be done by representing the thinking previously done by the group, using proved principles of attitude and behavior change, making a special effort to gain listeners' trust, trying to make a good sense to them, showing that persons they trust agree with the group, and present the group's message in a clear and organized manner.

### **III. The Analytical Hierarchy Process for Decisions In a Complex World:**

#### **A. Coping with Complexity:**

To the best of one's understanding, the world is a complex system of interacting elements. Unfortunately, in this complex world system, one is forced to cope with more problems and not having enough resources to handle. To deal with unstructured social, economic, and political issues, it is needed to order the priorities, to agree that one objective outweighs another in the short term, and to make tradeoffs to serve the greatest common interest. What is needed is not a more complicated way of thinking, since it is difficult enough to do simple thinking. Rather, it is needed to view existing problems in an organized but complex framework that allows for interaction and interdependence among factors and still enables one to think about them in a simple way.

The analytic hierarchy process (AHP) provides such a framework. It enables one to make effective decisions on complex issues by simplifying and expediting the natural decision-making processes. Basically, the AHP is a method of breaking down a complex, unstructured situation into its component parts; arranging these parts, or variables, into a hierarchic order; assigning numerical values to subjective judgments on the relative importance of each variable; and

synthesizing the judgments to determine which variables have the highest priority and should be acted upon to influence the outcome of the situation. The AHP also provides an effective structure for group decision-making by imposing a discipline on the group's thought processes. The necessity of assigning a numerical value to each variable of the problem helps decision makers to maintain cohesive thought patterns and to reach a conclusion. In addition, the consensual nature of group decision-making improves the consistency of the judgments and enhances the reliability of the AHP as a decision-making tool.

In solving problems by explicit logical analysis, three principles can be distinguished: The principle of constructing hierarchies, the principle of establishing priorities, and the principle of logical consistency. These natural principles of analytic thought underlie the AHP.

## **B. Principles of Analytic Thinking:**

### **B.1. Structuring Hierarchies:**

Humans have the ability to perceive things and ideas, to identify them, and to communicate what they observe. For detailed knowledge our minds structure complex reality into its constituent parts, and these in turn into their parts, and so on hierarchically. The number of parts usually ranges between five and nine. So, by breaking down reality into homogeneous clusters and subdividing the clusters into smaller ones, we can integrate large amount of information into the structure of a problem and form a more complete picture of the whole system.

**B.2. Setting Priorities:**

Humans also have the ability to perceive relationships among the things they observe, to compare pairs of similar things against certain criteria, and to discriminate between both members of a pair by judging the intensity of their preference for one over the other. Then they synthesize their judgments- through imagination or, with the AHP, through a new logical process- and gain a better understanding of the whole system. After establishing relationships between the elements of each level of the hierarchy by comparing the elements in pairs, a relative impact of the elements of a given level on each element of the next higher level is represented. In this context the latter element serves as a criterion and is called a **property**. The result of this discrimination process is a **vector of priority**, or of relative importance, of the elements with respect to each property. This pair-wise comparison is repeated for all the elements in each level. The final step is to come down the hierarchy by weighing each vector by the priority of its property. This synthesis results in a set of net priority weights for the bottom level. The element with the highest weight is the one that merits the most serious consideration for action, although the others are not ruled out entirely.

**B.3. Logical Consistency:**

Humans have the ability to establish relationships among objects or ideas in such a way that they are coherent- that is, they relate well to each other and their relations exhibit consistency. The first is that similar ideas or objects are grouped according to homogeneity and relevance. The second meaning of consistency is that the intensities of relations among ideas or objects based on a particular criterion justify each other in some logical way. In utilizing these principles, the

analytic hierarchy process incorporates both the qualitative and the quantitative aspects of human thought: The qualitative to define the problem and its hierarchy, and the quantitative to express judgments and preferences concisely. It clearly shows that for better decision making the quantitative aspect is basic to making sound decisions in complex situations where it is necessary to determine priorities and make tradeoffs. To calculate priorities, we need a practical method of generating scales for measurement.

**C. Measurement:**

People are not generally wary, if not distrustful, when numbers are introduced into the traditional process of decision making. But appropriately chosen numbers can represent variations in feelings more faithfully than can words or rhetoric.

**D. AHP: A Flexible Model for Decision Making:**

These basic observations on human nature, analytic thinking, and measurement have led to the development of a useful model for solving problems quantitatively. The analytic hierarchy process is a flexible model that allows individuals or groups to shape ideas and define problems by making their own assumptions and deriving the desired solution for them; It also enables people to test sensitivity of the solution, or outcome, to changes in information. Designed to accommodate our human nature rather than force us into a mode of thinking that may violate our better judgment, the AHP is a powerful process for tackling complex political and socio-economic problems.

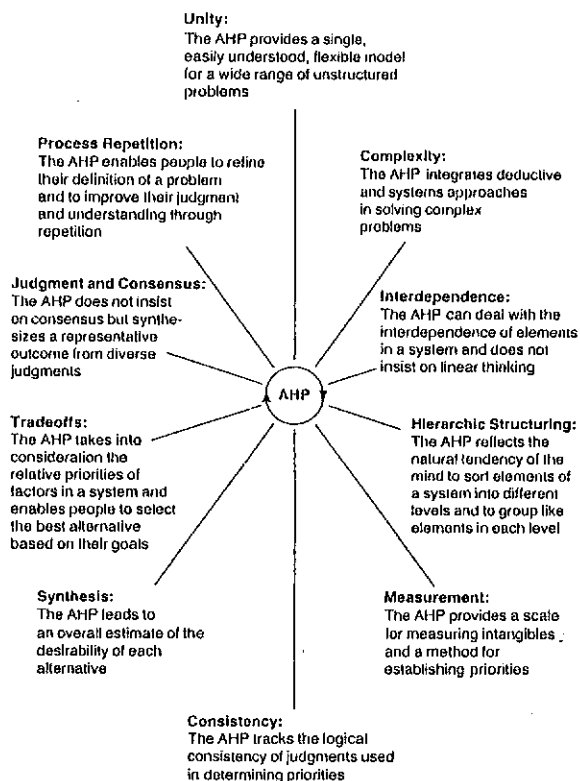
The AHP incorporates judgment and personal values in a logical way. It depends on imagination, experience, and knowledge to structure the hierarchy of a problem and on logic, intuition, and experience to provide judgments. Once accepted and followed, the AHP shows us how to connect elements of one part of the problem with those of another to obtain the combined outcome. It is a process for identifying, understanding and assessing the interactions of a system as a whole.

To define a complex problem and to develop sound judgments, the AHP must be progressively repeated, or iterated, over time; one can hardly expect instant solutions to complicated problems with which one has wrestled for a long time. The AHP is flexible enough to allow revision- decision makers can both expand the elements of a problem hierarchy and change their judgments. It also permits them to investigate the sensitivity of the outcome to whatever kinds of change may be anticipated. Each iteration of the AHP is like hypothesis making and testing; the progressive refinement of hypotheses leads to a better understanding of the system.

Another feature of the AHP is that it provides a framework for group participation in decision making or problem solving. Indeed, the conceptualization of any problem by the analytic hierarchy process requires one to consider ideas, judgments and facts accepted by others as essential aspects of the problem. Group participation can contribute to the overall validity of the outcome, although perhaps not the ease of implementation if the views diverge widely. Thus one could include in the process any information derived scientifically or intuitively.

The process can be applied to real problems and is particularly useful for allocating resources, planning, analyzing the impact of policy, and resolving conflicts. Figure 2-2 summarizes the advantages of using AHP as a new approach to problem solving and decision making.

**Figure 2-2:**



### **D.1. Hierarchies: A Tool of the Mind:**

Hierarchies are a fundamental tool of the human mind. They involve identifying the elements of a problem, grouping the elements at each level of the hierarchy into homogeneous sets, and arranging these sets in different levels.



Hierarchies can be divided into two kinds: Structural and Functional. In structural hierarchies, complex systems are structured into their constituent parts in descending order according to structural properties such as size, shape, color, or age. In contrast, functional hierarchies decompose complex systems into their constituent parts according to their essential relationships. Each set of elements in a functional hierarchy occupies a level of the hierarchy. The top level, called the focus, consists of only one element: the broad, overall objective. Subsequent levels may each have several elements, although their number is usually small- between five and nine. Because the elements in one level are to be compared with one another against a criterion in the next higher level, the elements in each level must be of the same order of magnitude. If the disparity between them is great, they should belong to different levels. For example, we cannot make a precise comparison between two jobs whose performances differ in difficulty by a factor of 100 because our judgment would be subject to significant error. Instead, we first group simple jobs into a cluster and compare the cluster with a job one order of magnitude more difficult to perform than a simple job. We then compare the jobs in the cluster among themselves according to difficulty of performance. When we compare the results of two comparison processes, we obtain a net comparison of a simple job with the more difficult one.

#### **D.1.1. Constructing Hierarchies:**

No inviolable rule exists for constructing hierarchies. The sample hierarchies offered throughout are presented not to prescribe certain frameworks but to stimulate thinking about what types of hierarchical levels to choose and what kinds of elements to include in the levels. One's approach to constructing a hierarchy depends on the kind of decision to be made. If it is a matter of choosing

among alternatives, we could start from the bottom level by listing the alternatives. The next level would consist of the criteria for judging the alternatives. And the top level would be a single element, the focus or overall purpose, in terms of which the criteria can be compared according to the importance of their contribution. There is no limit to the number of levels in a hierarchy. If one is unable to compare the elements of a level in terms of the elements of the next higher level, one must ask in what terms they can be compared and then seek an intermediate level that should amount to a breakdown of the elements of the next higher level. Thus, a new level has been introduced to facilitate the analysis for comparisons and to increase the precision for judgments. Now we can answer the main question: How much more does one element contribute than another to satisfying a criterion in the next higher level of the hierarchy?<sup>28</sup>

### **G.2. How to Structure a Hierarchy:**

- 1- Identify overall goal. What are you trying to accomplish? What is the main question ?*
- 2- Identify subgoals of overall goal. If relevant, identify time horizons that affect the decision.*
- 3- Identify criteria that must be satisfied to fulfill subgoals of the overall goal.*
- 4- Identify subcriteria under each criterion. Note that subcriteria might be intervals of numerics.*
- 5- Identify in descending levels, as needed, actor objectives, and actor policies- in this order.*
- 6- Identify alternatives or outcomes.*
- 7- For YES-NO decisions include for example doing and not doing the alternative.*
- 8- It is often useful to construct two hierarchies, one for benefits and one for costs to decide on the best alternative, particularly in case of YES-No decisions. Ratios of marginal benefits to marginal costs are formed and the alternative with largest ratio is chosen.*

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<sup>28</sup> Thomas L. Saaty, Decision-Making for Leaders, RWS Publications, Pittsburgh (1988), page 32

**D.1.3. An Approach to Hierarchies:**

Most problems arise because we do not know the internal dynamics of a system in enough detail to identify cause-and-effect relationships. If we were able to do so, the problem could be reduced to one of social engineering, as we would know at what points in the system intervention is necessary to bring about the desired objective. The crucial contribution of the analytic hierarchy process is that it enables us to make practical decisions based on a "precausal" understanding—namely, on our feelings and judgments about the relative impact of one variable on another.

In sum, when constructing hierarchies one must include enough relevant detail to depict the problem as thoroughly as possible. Consider the environment surrounding the problem. Identify the issues or attributes that you feel contribute to the solution. Identify the participants associated with the problem. Arranging the goals, attributes, issues, and stakeholders in a hierarchy serves two purposes: It provides an overall view of the complex relationships inherent in the situation, and it permits the decision maker to assess whether he or she is comparing issues of the same order of magnitude in weight or impact on the same solution.

The hierarchy does not have to be complete; that is, an element in a given level does not have to function as a criterion for all the elements in the level below. Thus, a hierarchy can be divided into sub-hierarchies sharing only a top most element. Further, a decision maker can insert or eliminate levels and elements as necessary to clarify the task of setting priorities or to sharpen the focus on one or more parts of the system. Elements that are of less immediate interest can be

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represented in general terms at the higher levels of the hierarchy and elements critical to the problem at hand can be developed in greater depth and specificity<sup>29</sup>.

In addition to identifying within a hierarchic structure the major factors that influence the outcome of a decision, we need a way to decide whether these factors have equal effects on the outcome or whether some of them are dominant and others so insignificant they can be ignored. This is accomplished through the process of priority setting. The task of setting a criteria requires that the criteria, the subcriteria, the properties or features of the alternatives being compared, and the alternatives themselves are gradually layered in the hierarchy so that the elements in each level are comparable among themselves in relation to the elements in the next higher level. Now the priorities are set for the elements in each level several times- once with respect to each criterion of the upper level. These in turn are prioritized with respect to the elements of the next higher level and so on. Finally a weighting process is used to obtain overall priorities. This is done by coming down the hierarchy and weighting the priorities measured in a level with respect to a criterion in the next higher level with the weight of that criterion. The weighted priorities can then be added for each element in the level to obtain its overall priority.

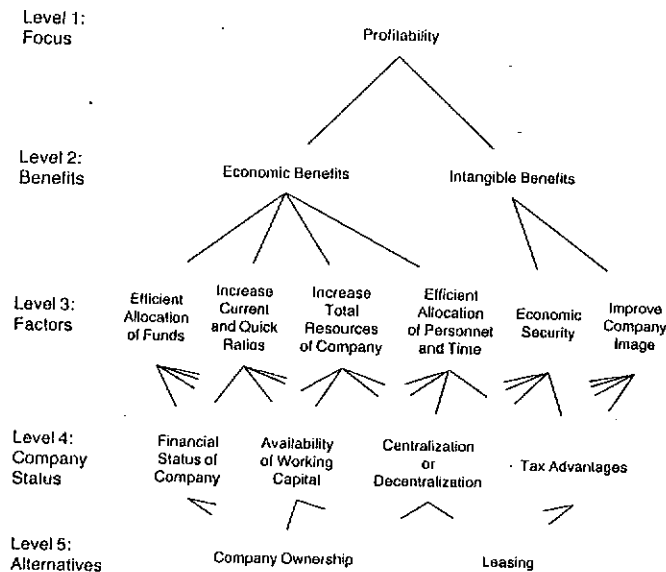
Finally, after judgments have been made on the impact of all the elements, and priorities have been computed for the hierarchy as a whole, the less important elements can be dropped from further consideration because of their relatively small impact on the overall objective. Now let us examine the following real-world application of the hierarchy.

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<sup>29</sup> Thomas L. Saaty, Decision-Making for Leaders, RWS Publications, Pittsburgh (1988), page 36

#### D.1.4. Hierarchy for Deciding on Buying or Leasing:

**Figure 2-3**



As you can see in figure 2-3, the decision regarding company ownership or leasing of a piece of capital equipment depends on the contribution to the company's profitability. This profitability has two dimensions: economic and intangible. The benefits depend on a number of factors that, in turn, depend on certain characteristics of the company. Buying or leasing would promote these characteristics to a varying extent.

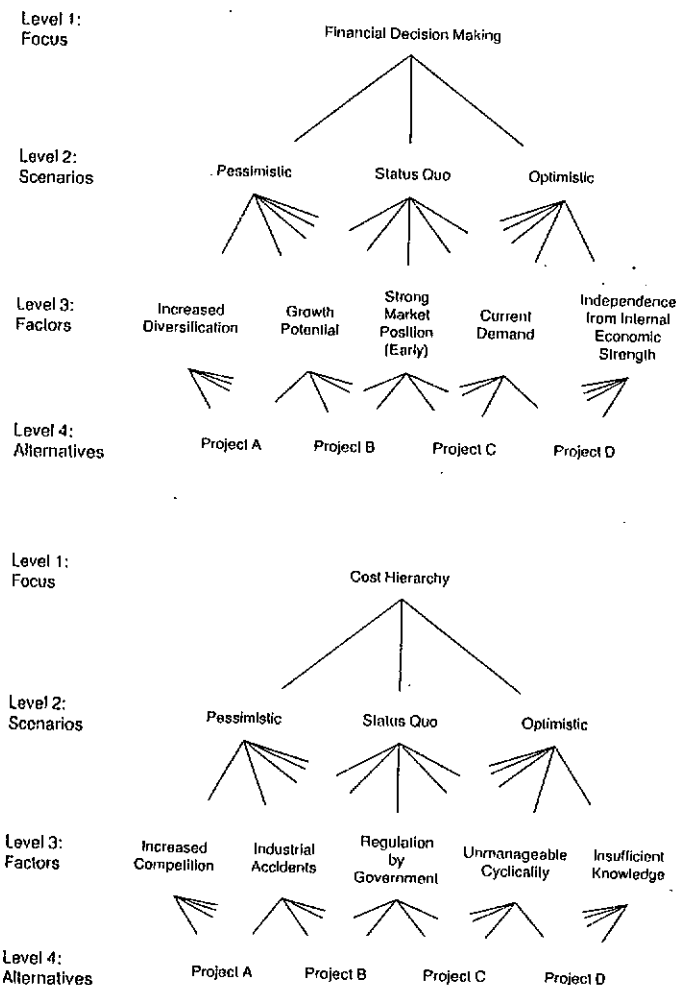
By setting priorities for the factors at a certain level with respect to the relevant factors at the previous level and finding the composite priorities, we can find to what extent, relatively speaking, the factors in the same level contribute to the firm's overall profitability. Extending this logic to the question of company ownership or leasing, we can say, in the judgment of the decision maker, which alternative is preferable.

In this example we take the intangible benefits explicitly into consideration for a decision, so the subjective judgments of the decision maker are also considered. This is unlike a conventional exercise where only the hard economic data are considered and then managerial judgment is used in a qualifying manner at the end.

**D.1.5. Some Other Practical Examples:**

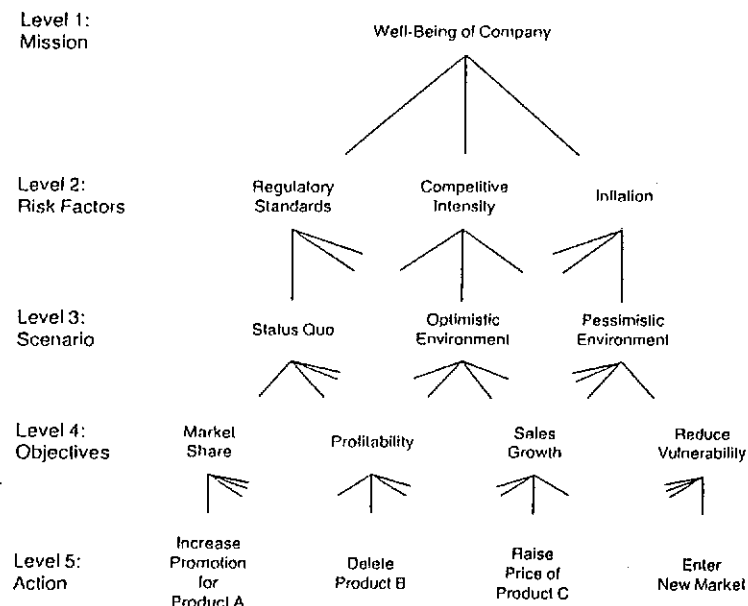
**A. Hierarchy For Making Financial Decision:**

**Figure 2-4:**



## B. Hierarchy For a Marketing Strategy

**Figure 2-5:**



### D.2. Establishing Priorities:

Complex relationships can always be analyzed by taking pairs of elements and relating them through their attributes. The object is to find from many things those that have a necessary connection. This causal approach to understanding complexity is complemented by the systems approach, whose object is to find the subsystems or dimensions in which the parts are connected.

The judgments we apply in making paired comparisons combine logical thinking with feeling developed from informed experience. The first step in establishing the priorities of elements in a decision problem is to make pairwise comparisons—that is, to compare the elements in pairs against a given criterion. For pairwise comparisons, the matrix is the preferred form. The matrix is a simple,

well- established tool that offers a framework for testing consistency, obtaining additional information through making all possible comparisons, and analyzing the sensitivity of overall priorities to changes in judgment. The matrix approach reflects the dual aspects of priorities: dominating and dominated. To fill the matrix of pair-wise comparisons, we use numbers to represent the relative importance of one element over another with respect to the property. Table 2-1 contains the scale of pair-wise comparisons. It defines and explains the values 1 through 9 assigned to judgments in comparing pairs of like elements in each level of a hierarchy against a criterion in the next higher level.

**Table 2-1:**

Intensity of Importance	Definition	Explanation
1	Equal importance	Two elements contribute equally to the property
3	Moderate importance of one over another	Experience and judgment slightly favor one element over another
5	Essential or strong importance	Experience and judgment strongly favor one element over another
7	Very strong importance	An element is strongly favored and its dominance is demonstrated in practice
9	extreme importance	The evidence favoring one element over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values between the two adjacent judgments	Compromise is needed between two judgments

\* Reciprocals: When activity I compared to J is assigned one of the above numbers, then activity J compared to I is assigned its reciprocal.

\*\* Rationals : Ratios arising from forcing consistency of judgments.



To obtain the set of overall priorities for a decision problem, we have to pull together or synthesize the judgments made in the pairwise comparisons- that is, we have to do some weighing and adding to give us a single number to indicate the priority of each element. The following example explains how to synthesize:

Suppose we want to decide which of three new cars - A Chevrolet, a Thunderbird, and a Lincoln, to buy on the basis of comfort. We draw a matrix with the criterion "comfort" listed in the upper left-hand corner and the cars listed in the column on the left and in a row on top (Table 2-2).

**Table 2-2:**

Comfort	Chevrolet	Thunderbird	Lincoln
Chevrolet	1	1/2	1/4
Thunderbird	2	1	1/2
Lincoln	4	2	1

We then put 1s in the diagonal positions as indicated. This matrix has nine entries to fill. Three are already committed to 1s. Three of the remaining six are reciprocals. This leaves three judgments to make. In general, if the matrix deals with, say, seven elements, the number of judgments needed to fill the entries is  $(7 * 7 - 7 / 2)$  equal to 21. We subtract the seven unit entries down the diagonal and divide by two because have the judgments are reciprocals that are entered automatically. We then ask: How much more comfortable is an average new Chevrolet than an average new Thunderbird and an average new Lincoln? Based

on our experience and personal preference, our judgment is that a Chevrolet is one-half as comfortable as a Thunderbird and one-fourth as comfortable as a Lincoln. To state these judgments in terms of the quantifiers in the scale, a Thunderbird is slightly more comfortable than a Chevrolet, and a Lincoln is between slightly and strongly more comfortable than a Chevrolet. Thus we enter the values 2 for the Thunderbird over the Chevrolet and 4 for the Lincoln over the Chevrolet. These numbers are the reciprocals of the two judgments comparing the Chevrolet with the other cars.

Remember that the element that appears in the left-hand column is always compared with the element appearing in the top row, and the value is given to the element in the column as it is compared with the element in the row. Next we want to synthesize our judgments to get an overall estimate of the relative priorities of these cars with respect to comfort. To do so, we first add the values in each column. Then we divide each entry in each column by the total of that column to obtain the normalized matrix (**Table 2-3**), which permits meaningful comparison among elements.

**Table 2-3:**

Comfort	Chevrolet	Thunderbird	Lincoln
Chevrolet	1/7	1/7	1/7
Thunderbird	2/7	2/7	2/7
Lincoln	4/7	4/7	4/7

Finally, we average over the rows by adding the values in each row of the normalized matrix and dividing the rows by the number of entries in each:

$$\frac{1/7 + 1/7 + 1/7}{3} = 1/7 = 0.14$$

3

$$\frac{2/7 + 2/7 + 2/7}{3} = 2/7 = 0.29$$

3

$$\frac{4/7 + 4/7 + 4/7}{3} = 4/7 = 0.57$$

3

This synthesis yield the percentages of overall relative priorities, or preferences, for Chevrolet, the Thunderbird, and the Lincoln: 14, 29, and 57 percent, respectively. As far as comfort is concerned, the Thunderbird and the Lincoln are thus about twice and four times more preferable than the Chevrolet.

### **D.3. Consistency:**

In decision-making problems it may be important to know how good our consistency is, because we may not want the decision to be based on judgments that have such low consistency that they appear to be random. On the other hand, perfect consistency is hard to live up to. Our judgments on the relative comfort of the three cars were consistent, but in real life specific circumstances often influence preferences, and circumstances change.

It is useful to remember that most new ideas that affect our lives tend to cause us to rearrange some of our preferences, thus making us inconsistent with our previous commitment. If we were able to program ourselves never to change our minds, we would be afraid to accept new ideas. All knowledge has to be

admitted into our narrow corridor between tolerable inconsistency and perfect consistency. Of course, a certain degree of consistency in setting priorities for elements or activities with respect to some criterion is necessary to get valid results in the real world. The AHP measures the overall consistency of judgments by means of *consistency ratio*. The value of the consistency ratio should be 10 percent or less. Let us continue with the example of cars and see how the AHP measures consistency. Suppose that we keep the first row of our pairwise comparison matrix but do not pay much attention to consistency with our previous judgments (table 2-4). In comparing the Thunderbird with the Lincoln, we enter the value 1/4 in the second row, third column, and enter its reciprocal 4 in the third row, second column:

**Table 2-4:**

	Chevrolet	Thunderbird	Lincoln
Comfort			
Chevrolet	1	1/2	1/4
Thunderbird	2	1	1/4
Lincoln	4	4	1
Column Total	7	5.5	1.5

Following the steps described earlier, we obtain the normalized matrix (table 2-5), its row sums, and the percentages of relative overall priorities. The percentages, 13, 21, and 66 percent, constitute the priority vector of the three cars with respect to comfort:

**Table 2-5:**

Comfort	Chevrolet	Thunderbird	Lincoln	Row Sums	Average Row Sum
Chevrolet	1/7	1/11	1/6	0.40	0.13
Thunderbird	2/7	2/11	1/6	0.63	0.21
Lincoln	4/7	8/11	4/6	1.97	0.66

Although the standing of Chevrolet has not been changed by much, the other two have changed by our reducing the value for the Thunderbird and raising it for the Lincoln. With inconsistency, all the values are changed. The question is : How significant is this change? Presumably we want to compare our inconsistency with the value it would have if the judgments were random. To do this, multiply the first column of the inconsistent matrix , changed to decimal form, by the relative priority of the Chevrolet (0.13), the second column by that of the Thunderbird (0.21), and the third column by that of Lincoln (0.66). Then total the entries in the rows appear in table 2-6 as:

**Table 2-6:**

Comfort	Chevrolet	Thunderbird	Lincoln	Row Total
Chevrolet	0.13	0.11	0.17	0.41
Thunderbird	0.26	0.21	0.17	0.64
Lincoln	0.52	0.84	0.66	2.02

Now we take the column of "Row Total" and divide each of its entries by the corresponding entry from the priority vector. We can now find the average of the three entries in the last column of the following figure:

$$\begin{array}{rclcl} 0.41 & / & 0.13 & = & 3.15 \\ 0.64 & / & 0.21 & = & 3.05 \\ 2.02 & / & 0.66 & = & 3.06 \end{array}$$

$$\frac{3.15 + 3.05 + 3.06}{3} = 3.09$$

By convention, the symbol for this number is  $\lambda$ . The consistency index is :

$$\frac{3.09 - 3}{2} = 0.045$$

The random value of the Consistency Index for  $n = 3$  is 0.58.

The consistency ratio is  $0.045/0.58 = 0.08$ , which indicates good consistency.

One way to improve consistency when it turns out to be unsatisfactory is to rank the activities by a simple order based on the weights obtained in the first run of the problem.

## **IV. The Systems Analysis Approach**

### **A. The Importance of Decision Making:**

Of all the managerial functions which executives perform, whether at top, middle, lower, or even worker levels, the act of making a decision is without equal in importance, that is to say, the act of making the *right* problem or opportunity.

This is not meant to downgrade the ever-needed and classical functions of planning, organizing, staffing, operating, controlling, appraising, and numerous others which must be carried on. A case could very well be made for planning, for example, as the primary function of management. But planning should be recognized as absolutely necessary from beginning to end and then over again in the decision-making process. This is also not meant to downgrade the necessity for management having to deal on a daily basis with technical skills, human skills, conceptual skills, and even imagination and risk. It does mean that in these, too, decision making is inherent in every interrelationship of men, machines, material, and technology.

If one sees decision making clearly as the heart of executive functioning, then the philosophy of what follows really affects all managerial actions. It is an inclusive method, more complete in its requirements and steps for the purpose of really shedding more light on the problem at hand. It recognizes the need for a technique embracing orderliness, rationality, sequential progress, and thoroughness in the search for top quality, optimum decisions. **Systems Analysis**

can and does include the steps of other approaches<sup>30</sup>. For example, cost effectiveness is often properly looked upon as the correct approach to problems of limited costs and achieving the most effectiveness for these costs. It is properly used for such purposes. However, cost effectiveness is but one of the techniques contained in the System Analysis approach, which assures that nothing is overlooked and recognizes tools and techniques for what they are- parts of the total system problem to be solved.

System Analysis can either emphasize, delete, or combine whatever steps are essential to the current problem. Its universality is its strength. It does take effort and time and it will continue to do so, but payoffs today are becoming increasingly very personal and societal matters of importance. It pushes us to use the best possible means of ensuring that they are optimum ones and not failures.

### **B. What is Systems Analysis Approach?**

The real goal of Systems Analysis is to teach decision makers to think in a special, orderly, and thorough way. It is more than formulas, figures, and computers; it is the ability to use them creatively and to rely on both quantitative methods and human judgments about problems and opportunities. It is the identification of the truly key objective(s) and not merely the contributing, less important one(s). Once the big objective or problem has been identified, the lesser, contributing ones are not ignored but are recognized for what they are- suboptimized problems that may contribute to the larger system problem.

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<sup>30</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 15



The idea of an analysis to provide advice is not new and, in concept, what needs to be done is simple and rather obvious. One strives to look at an entire problem, as a whole, in context, and to compare alternative choices in the light of their possible outcomes. Three basics are listed as key ingredients<sup>31</sup> :

- 1- A systematic investigation of the decision-maker's objectives and the relevant criteria for deciding the ones that promise to achieve those objectives are needed;
- 2- The alternatives must be clearly defined, fully explored, examined for feasibility, and then and only then, compared in terms of effectiveness and cost, taking time and risk always into account. It is well to look first for *gross* differences in the alternatives in terms of cost and effectiveness, and specifically for differences of the sort that have a chance of surviving the quantitative tests and the various uncertainties and intangibles; and
- 3- Finally, every attempt must be made to design better alternatives and select other goals if those previously examined are unsatisfactory.

Another listing of the critical steps of Systems Analysis is the following version<sup>32</sup> :

- 1- Defining objectives (problems and opportunities)
- 2- Designing alternative systems to achieve those objectives
- 3- Evaluating the alternatives in terms of effectiveness and costs
- 4- Questioning the objectives and all consumptions
- 5- Opening up new alternatives
- 6- Establishing new objectives
- 7- Repeating the cycle until a satisfactory solution is reached; hopefully the optimum solution, whether it be in keeping with the criteria of effectiveness, cost, or both.

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<sup>31</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 17

<sup>32</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 18

### C. Who uses Systems Analysis?

It might be well to eliminate first those who do not use Systems Analysis like those who still believe in the strictly intuitive method of decision making despite the complexities and uncertainties in modern organizations and management, to say nothing of high failure rate of business. Today, although called by other names, Systems Analysis is practiced by large organizations having to cope with problems of scarce resources and high competition. It has become the method not only for market managers, but for scientists, engineers, production managers, finance directors, and chief executive officers of all kinds. It ranks with automation, management science, computers, nuclear power, and similar wonders of our age simply because it helps solve problems and often *uses* the other "wonders" to solve other problems.

There is no doubt that, as problems increase in complexity, the group method is better. Moreover, there is no doubt that for either an individual or group, an analytical procedure of any kind is better. In a minor decision or one in which a single individual has all the necessary skills to make an analysis, a group approach may be wasteful. However, when a problem involves management scientists, planners, statisticians, and other distinct disciplines, no one individual can be expected to provide all the inputs and process them. Systems Analysis used in problems at the higher levels invariably requires a team made up of people with several skills and varied experience.

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**D. Phases of Systems Analysis:****D.1 Phase One: The Formulation Phase:**

Decision makers face uncertainty far more than certainty in attempting to solve their problems or in taking advantage of opportunities simply because more uncertainties exist in the world of organization and management than do certainties. In management, the game becomes one of probability judging and risk taking at all levels. The higher the level, the greater the uncertainties, the risks, and the consequences. But managers, like rational people, do not simply give up in the face of uncertainties and retreat into a state of inaction.

It is in the conceptual phase of formulation that the decision maker, very much like a medical doctor, is faced head-on with the problems of diagnosing the system involved, the cause of the problem, the objective which, if attained, will cure it, and the uncertainties and assumptions, which must be dealt with to proceed with a cure. It is in this formulation phase that the crucial step of localizing and limiting the problem is essential to coping with it. These are really difficult jobs, the jobs of isolating the real issue, of seeing it in total context with other problems, of facing up to its solvability, of capable of solution in time and within available resources. The primary purpose of systems analysis is to advise a decision maker in determining the best possible alternatives to the correct question, in developing good alternatives, in sharpening his intuition and adding to his basis for judgment, and then in exposing and exploring uncertainties.<sup>33</sup>

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<sup>33</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 39

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Recognition of a system and subsystem of all organized effort is the first step in the formulation phase once the presence of uncertainties has been accepted as a fact of life and progress. It is something like delegation in management. Delegation is the fine art of getting the job done at the optimum level, on which is more often than not at a much lower level than imagined. Good delegation is exemplified when decision making is thrust *downward* to the lowest level of individual *competence* that includes willingness as well. Without proper delegation, precious time is wasted by the top decision maker, to say nothing of the adverse effects upon those subordinates who are quite competent to make lower level decisions. At its best, the formulation phase and its emphasis on isolation of the pertinent systems will prove to be subjective in several respects. It is for this reason that an analyst should not blindly accept the decision maker's original idea of the system and objective to explore. Not to question the objective is an injustice to the decision maker as well as to the analyst<sup>34</sup>. Systems are very closely tied to decision situations. To change the system goal or focus is to change the decision situation and obviously to change the objectives. Systems, decision situations, and objectives are very flexible and can be enlarged or limited in scope. Their direction may also be changed. The skills and judgments involved in carrying out the early steps of the formulation phase will affect the remainder of the problem solution or the opportunity involved.

Within any system or subsystem structure, a condition must exist that presents a decision maker within the opportunity to make a decision. Additionally, the situation should offer alternative courses of action to resolve the decision situation. Again, it is appropriate to repeat an earlier observation: if there is no decision-making situation there can be no decision, no alternatives. A decision situation is the natural result of the discovery of a current problem, or of a

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<sup>34</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 45

foreseeable problem, or of a foreseeable opportunity to take advantage of a pursue.

With the system and decision situation as background, the next step is to determine the objective(s) or problem(s). The statement of the objective is an attempt to come up with a solid, definitive one which sets forth exactly *what* the decision-maker desires to achieve. Note the emphasis on the *what* rather than the *how* at this stage. In order to come up with any of the four objectives, that is, purpose, problem, position, or opportunity, a period of intelligent and thorough probing- and continued probing- must be carried out by the decision maker and the analyst to strive for the real objective. This is the time for imagination, for probing depths, for searching upward, inward, outward, in all directions, to isolate *the* all-important objective<sup>35</sup>. It is time for objectivity. It is time to become both listener and speaker, both critic and criticized. It is time to "pull out the stops" in good reasoning and open-mindedness. It is also the time for decision, or else the analysis stops here. In identifying the correct objective, it cannot be overemphasized that it is far more important to discover the right one than it is to find the perfect optimizations techniques and processes. Sub-objectives and sub-optimization of the problem are often necessary and natural, but they should be recognized for what they are- pieces of the whole.

Before we leave the formulation phase, its fourth and final step must be considered. It, too, is the highly judgmental step of making assumptions. Assumptions are not only embodied in the formulation phase, they are necessary throughout the entire analytic study. The first thing to realize about them is that they are inevitable. The second is that sound judgment should be used to ensure that they are reasonable assumptions. The third is to make them explicit. State

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<sup>35</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 49

them openly and give reasons for including them, and then examine the assumptions closely to have them accepted by those concerned, especially by the decision maker<sup>36</sup>.

Assumptions are necessary to treat the nebulous area of uncertainty and the inevitable lack of sufficient information to reduce or remove uncertainty. They are used to limit the scope of a problem or opportunity, and to limit the scope of objectives or alternatives. However, once assumptions are used to define the scope of analysis, they should be maintained throughout unless the iterative process reveals an improper start or better objectives. The need to fully recognize assumptions, and the uncertainties they spring from, and then be entirely honest about the inclusion in every step, is a major requirement which have a profound affect on good analysis.

#### **D.2. The Search Phase**

Once the system encompassing a decision situation has been decided upon and the objectives or problem defined (the solution of which will solve the decision situation), and the assumptions made clear, it is time to move from the formulation phase to the search phase. Search is completely dependent upon a definition of the right problem or the correct opportunity, else all steps which follow will obviously be in pursuit of the wrong ends<sup>37</sup>.

As the inquiry into the fascinating subject of alternatives begins, the first alternatives to consider are the *alternative source of advice* and expertise. The most common source is someone with intuition- and that could include any one of

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<sup>36</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 53

<sup>37</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 57

us. Intuition is not analytic. On the other hand it is not mere guess work. Unfortunately, too, the strictly intuitive decision maker often really believes in his or her solution above all others and has few qualms about stating that his or her intuitive opinion is enough. At the other end of the continuum of decision-making processes is Systems Analysis. In addition to the procedures compared later, mention should be made of one other source or alternative to a problem- the expert. Not to be confused with the intuitive individual, the expert is presumably trained, experienced, and impartial in approaching a problem. An expert who also believes in Systems Analysis should have endorsement- unlike the expert who bases his decisions on intuition. Whatever the alternative means, whether an intuitive individual, expert, group, or committee, it is fitting to conclude that in problem solving, although the same basic steps are followed, all choices are susceptible to the acid test of whether those concerned have done a good job or not.

The search phase leads into the very heart of Systems Analysis approach. It is the phase in which alternatives, costs, effectiveness, benefits, and models are all directed toward quantifying and illuminating the problem as much as possible<sup>38</sup>. Its foundation rests squarely on the formulation phase which preceded it. The objective dictated alternatives which would be complete and achieve the objective. Now it is a good time to emphasize this point and say: "It is more important to choose the 'right' objective than it is to make the 'right' choice between alternatives."

If the objective is a valid one and there is agreement that it is the opportunity or problem which, if resolved, will best satisfy the criterion, then the search for both quantitative and qualitative (judgmental again) variables and the

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<sup>38</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 82

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full consideration of every alternative, every cost, and every benefit become a series of important steps which can provide the feeling of security that comes from valid numbers and relationships, and their rigorous reviews. If alternatives are dropped, replaced, or modified in the search phase, a change will result in costs, benefits, calculations, and the quantitative tools selected, as well as in the qualitative judgments made. Care should be taken to recognize that the direction may have changed and the process must be started again.

As in the formulation phase, assumptions and uncertainties are everywhere to be found in the search phase. Again, if they are recognized, faced up to, made explicit, and put to the tests of rationality and reasonableness, they are not insurmountable problems. The idea is to *do* something constructive, to look *forward* to a productive solution in spite of uncertainties which may be reasonably "assumed."

Since we are to use several quantitative tools and calculations to measure costs and benefits, it is necessary to realize that many of the measurements are really *ad hoc*. That is, there is rarely a *single* measure of effectiveness or a benefit which is completely adequate. There is rarely one which pleases everybody. Effectiveness lies within the final preview of decision makers who must apply judgment. This is acceptable as long as it is clear to all that it is impossible to satisfy all entrusted parties involved in complex problems.

Models take form in the mind without deliberate thought. Some of the simplest are the best.  $P = R - C$ , Profit equals Revenues minus Costs, is still a model everyone can grasp, and yet its ramifications can be exceedingly complex. As an abstraction, the value of models lies in their ability to represent things we could never hope to manipulate in reality (if we could, the costs would be



staggering). Models bridge the way to evaluation and as such, could be part of the evaluation phase which comes next. Management models interest us the most in Systems Analysis because they often *represent* the heart of management- *decision situations*. Their use permits managers to assess and predict alternatives without the cost of actually carrying them out<sup>39</sup>.

To understand the value of all the effort expended in the search phase is to be aware of the *payoffs* of such effort- better management decisions, based on better information, and the increased likelihood of being *right* about the way to reach one's goals.

### **D.3. The Evaluation Phase:**

In the evaluation phase, the primary task is to choose from among alternatives, using an appropriate criterion selected as a decision rule. To an analyst the word criterion has two parts: First, it is a way of relating effectiveness and cost. Second, it is a decision rule. Common decision rules used in the formulation of a criterion are not fixed. They can range from fixed cost, maximum effectiveness; to fixed effectiveness, minimal cost; to some ratio between them; to profit (where units are compatible); to the constraints of the decision environment, such as politics or social constraints; to several factors which are appropriate, such as best estimate, worst case, and dominance<sup>40</sup>.

The *usual* form of criterion is a statement about both effectiveness and cost; however, it does not always say *what* effectiveness to maximize and *what* cost to minimize. It is likely that some types of effectiveness are more critical than others.

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<sup>39</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 83

<sup>40</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 99

Also, in addition to an accurate statement of the *kind* of effectiveness desired, it is necessary to define what *types* of cost are going to be included in the criterion.

No matter which criterion or criteria are chosen, the point is to examine it or them closely to see exactly what objectives are really being addressed. This can be done by examining what effects the single purpose criterion used would have on the operation. In real life recognizing which alternatives are not feasible due to constraints, applicability, and the pursuit of objectives which do not solve the problem, is just as important as discovering those alternatives which are feasible. All decision are made within some constraints. Or at least almost all.

The criterion is *one's own* determination of the test one wishes to apply in selecting an alternative. It is anticipatory, in that decision makers determine in advance the rule or test which, when applied, will help them select the preferred solution or their idea of an optimum course of action. It is the *standard* by which judgment is made about the relative merits of a choice. It is the standard for ranking alternatives in order of desirability, *provided* they achieve *the* objective determined earlier.

Normally, the criterion or decision rule is expressed in one of the following ways:

- 1- Provide the *same level of effectiveness* for all alternatives, and select the one with the least cost. This is the discounted or present value cost, if investment and returns are concerned, which is the situation in the greatest number of cases. This is called the *least cost* alternative or, to reverse it, the fixed effectiveness, minimized cost rule.

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- 2- Provide the *same cost* for all alternatives and select the one with the *most effectiveness*. As a rule, in cases where benefits or outputs are the determining factor, it is usual to prefer that alternative which yields the greatest effectiveness for a given level of cost, again discounted where applicable. In situations where quantifying benefits or outputs is difficult, it still pays to provide as much useful information as possible to enable a good decision based upon knowledge and sound reasoning. This is called the alternative of *maximum benefits*, or fixed cost, maximum benefits.
  
  - 3- Determine a *ratio* between cost and effectiveness. Care should be exercised here, as a favorable ratio must be a feasible one.
  
  - 4- When *both benefits and costs are unequal*, there is no all-purpose criterion for ranking alternatives. However, if the benefits of a higher cost alternative are judged greater than a lesser cost alternative, a choice must still be made. In such a case, if analysis can show the extent to which benefits would have to increase to *justify* the choice of the added cost alternative, it will have served its purpose. This is called the *unequal cost and unequal benefits alternative*. It is one which occurs more often than imagined.
  
  - 5- Where all units are compatible and comparable, *profit* is usually the criterion, as it is in many business situations.
  
  - 6- If special considerations require the selection of something other than a cost/benefit alternative and criterion, the situation requires a decision, but one that is compelling and defensible. These kinds of criteria include those relating to choices between contingencies such as the best estimate, the worse case, a priori analysis, or dominance.

It is interesting to know that in any decision theory one may use, little guidance is provided as to how to really select decision rules, other than the guidelines given above. The selection is pretty much up to the analyst and decision maker. It is equally important to look outside the model, to contemplate other alternatives which fit the objective. These alternatives may appear when assumptions are questioned. Delineating the whole range of alternatives and making a list of similar and different factors can yield insight, meaning, and comprehensiveness.

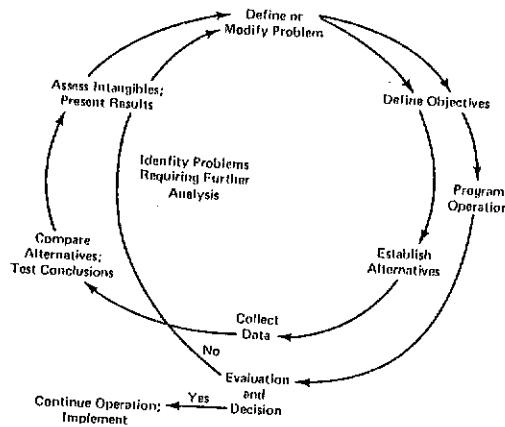
#### **D.4. The Interpretation Phase:**

The interpretation phase may be summed up as the phase of using the predictions obtained from the calculations and models, and the costs and effectiveness information derived from the predictions. This phase also uses whatever other information or insight is relevant to further compare alternatives, then derives conclusions about them, and then decides upon a course of action. The key phrase is "decide upon a course of action."

The players are the decision maker and the analysts. The decision is promulgated in the form of a recommendation for action by the players. This may sound like a bit of heresy to allow the analyst to participate, especially to Systems Analysis "purists," but the fact is, he or she does participate. Decision makers should keep in mind that decisions are rarely irrevocable except in certain extreme circumstances. It is more usual to find that if the decision needs to be revoked, the System Analysis Approach not only allows for another round of analysis by restricting the trial to something far less than an all-out implementation but also *insists* upon another such round if the decision is distrusted, does not solve the

problem, or is simply not the best one. The process is called iteration and the following figures (figure 2-6 and figure 2-7) illustrate it, showing what should take place, following the interpretation phase during verification.

**Figure 2-6:**



**Figure 2-7:**

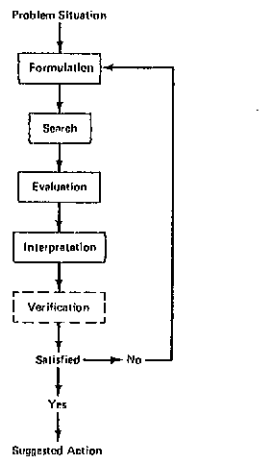
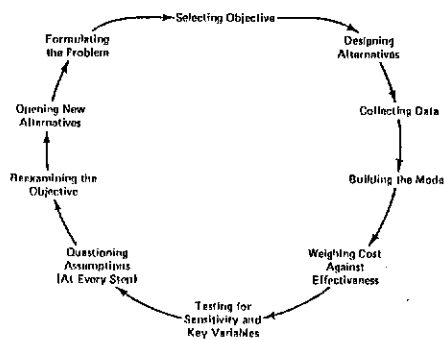


FIGURE 6.1 Phases of Systems Analysis



#### **D.4.1 The Role of the Decision Maker**

In the interpretation phase, the decision maker or the sponsor is primarily responsible for interpreting the analyst's work, but he should be assisted by the analyst in such interpretation. The decision maker is probably the best one to inject the real world back into the problem, which may lead to an iterative cycle. If he does, it is usually because the model was imperfect in representing the real world, or because he simply needs a better answer.

#### **D.4.2 The Role of the Analyst:**

An analyst should arrive at conclusions which, by their obvious appropriateness, become recommendations toward a decision. It is true that decision making is the final province of the authority who sets forth the objective. Yet common sense dictates that the authority is going to and often does query the analyst's recommendations.

The recommendation which flows from a good report or study can be the result of single or joint actions. Fortunately, Systems Analysis has even one more phase, that of verification, before proceeding to full implementation, or returning to the problem and objective in order to carry out the iterative process. The verification phase is usually short but the crucial point is to decide whether to "go" or "no go". This phase will be described briefly in what follows.

### **D.5. The Verification Phase:**

The verification phase is an evaluation of the initial (trial) implementation followed by a "go" or "no go" decision for full implementation. When the alternative decided upon is built, simulated, or produced in any form, a host of strange events can follow. Significant omissions and unforeseen relationships and side effects suddenly manifest themselves and must be taken into consideration. After all, if the System Analysis Approach is to be true to its precepts, its effects upon other systems and subsystems are important. The worst thing to do is to ignore them. The best thing is to face them and consider those which may "drive" the problem to an entirely different solution or to those which may be acceptable as trade-offs.

The first of such unforeseen factors may be labeled constraints; that is, constraints which are in addition to those initially recognized and which were dealt with in the analysis. It must be obvious that to achieve the most efficient and effective objective, considerations greater than cost and effectiveness are at stake<sup>41</sup>. There are *physical constraints*, the constraints of the state of technology and knowledge at a given time, for example. There are *legal and administrative constraints* also. There are *distributional constraints*, i.e., the kind which affect the equality of economic or other kinds of distributions to certain income groups or age groups. Also there are *political, financial and religious constraints* that should be taken into consideration. To ignore constraints is to depart from the real world. Conversely, to regard all solutions except one as being blocked by some constraint is to remove the problem from *any* analysis.

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<sup>41</sup> Cornell, The Decision Maker's Handbook, Prentice-Hall, Inc., New Jersey (1980), page 118

It is in this phase that the analysis is revealed to all concerned and to others who believe they are concerned. The "adversary process" is triggered and if care is not taken, a good analysis can be negated by those who attack it both as an analysis or with counter-analysis. This can be an agonizing period for one who may have devoted his or her very best to the problem, but it is the real world. Adequate preparation and a faultless report, systematically arrived at and unchallengeable in its rigor and thoroughness, are the best counter-weapons.

Then too, it is during the phases of implementation and verification that other unforeseen effects appear. Things that are believed to be measurable may prove not to be so; things which seemed to be commensurable may prove not to be so; unknown and uncertainties appear which require readjustments of forecasts, discount rates, sensitivity testing, time adjustments, etc.- all of which are designed to reduce the amount of uncertainty and to make known the unknown; to treat side effects and spillovers which may not have been foreseen, especially the important external ones.

But all these impediments must have occurred in the past and will again. And they have been successfully resolved. The progress and wealth of the world testify to a spirit of successful optimistic enterprise, and to the ingenuity of mankind.

### **E. The Future of System Analysis:**

And so we come to the close of this codification of a workable and a successful means of decision making- the Systems Analysis Approach. The attempt has been to lay out a means of performing more correctly and comfortably



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the biggest job of management- Decision Making. There have been some changes in Systems Analysis since its beginnings. One of the biggest has been the complex analytical activities required to activate data processing, and the quantitative inputs of management science. Now one has the technical capacity to automate a great portion of decision making. One has also the human capacity to use the technical capacity to arrive at non-programmed decisions.

No one has monopoly on decision making. Individuals, groups, clubs, boards of directors, citizens, parents, chairpersons, and presidents must choose from an available, feasible set of alternatives. How well they will do depends upon the method of arriving at the set of alternatives and a proper choice.

Systems Analysis strives to do more, however, than simply supply solutions that correctly follow from sets of arbitrarily chosen assumptions in narrow problems. It aspires to help the decision-maker find solutions that experience will confirm in the broadest of problems. The goal... is still far from being attained. But a greater understanding of the nature and roles of systems analysis promises to bring it closer.

## **V. Normative Theory for Analysis of Individual Decision Making**

### **A. Scope of Individual Decision Making:**

Decision making is making consequential choices. Decision analysis is thinking in advance about what alternatives to consider and how to choose a good, better, or best alternative.

It is difficult for anyone, whether layman or specialist expert, to apply generalized decision theory and methods of decision analysis in any of the fields that could come across our minds, unless he or she is technically competent in that field. Knowing calculus alone does not prepare one to be either an economist or an engineer, but it is helpful in economics and essential in most fields of engineering. Similarly knowing decision theory alone does not prepare one to make competent decisions in economics or engineering, but it may be very helpful in both cases. The scope for decision analysis is indeed very broad. However, there is one critical caution: apply it only on your own turf.

### **B. Subjective Approach: Using Personal Utilities**

The subjective approach to decision analysis starts with postulates about *rational behavior*. Roughly speaking, the postulates say that if one is a rational person, he can order his preferences in a logically consistent manner. Here, the aim is to discover the decision maker's preference ordering of specified outcomes (or objects, or actions), and his corresponding *personal utilities*. The general approach is to require that the decision maker reveal his preferences by making pair-wise comparisons. Then, using mathematical assumptions and various inference procedures, one can construct a unique preference ordering and corresponding utility function.

The concept of rationality is the foundation of modern decision theory<sup>42</sup>. According to the definition of rationality:

*If A is preferred to B  
and If B is preferred to C  
then A is preferred to C*

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<sup>42</sup> Donald J. Clough, Decisions in Public & Private Sectors, Prentice-Hall, Inc., New Jersey (1984), page 190

This represents a strong behavioral assumption. In reality, a person may have a great difficulty identifying alternatives, putting them into a neat preference order, and “optimizing” by choosing the one that has greatest utility. We should coin the term “bounded rationality” to describe the limits of rationality in management decision making; managers make “satisficing” choices, rather than the “optimizing” choices of rational man.

### **C. Objective Approach: Decisions With Simple Consequences**

Suppose that General Motors contemplates several alternative courses of action, which are called simple acts. These acts are mutually exclusive, which means that only one of them can be chosen. Each act is a combination of production quantity (liters) and fixed price (\$/liters), as follows:

A1: produce 20,000 liters, price at \$1.5/liter.

A2: produce 40,000 liters, price at \$1.5/liter.

A3: produce 60,000 liters, price at \$1.5/liter.

A4: produce 80,000 liters, price at \$1.5/liter.

Whichever one of these simple acts is chosen, there are several possible outcomes in terms of the sales quantity (liters). These outcomes are mutually exclusive, since only one of them can occur. Because complete market information is lacking, the GM views these outcomes as uncertain. The interested cannot predict which outcome will occur. He cannot predict the probabilities of occurrences. He cannot predict competitive conditions or possibilities. The first thing we should think about is the decision payoff matrix (table 2-7). The profit corresponding to each act-outcome pair is commonly called a payoff.

**Table 2-7:**

Alternative Act (Liters, Price)	O1 20000 liters	O2 40000 liters	O3 60000 liters	O4 80000 liters	Minimum Profit	Maximum Profit
A1	10	n.f.	n.f.	n.f.	10	10
A2	0	30	n.f.	n.f.	0	30
A3	-10	20	50	n.f.	-10	50
A4	-20	10	40	70	-20	70

**n.f.: Not Feasible**

### **C.1. Maximin Criterion (Von Neumann):**

The maximin criterion which focuses on the worst possible payoffs, is used instinctively by conservative decision makers. Referring to table 2-7, and looking across the first row, the minimum payoff is \$10,000. Across row 2 it is \$0, across row 3 it is -\$10,000, and across row 4, it is -\$20,000. The best of these four worst payoffs is \$10,000, corresponding to the first act: output 20,000 liters, price \$1.5/liter. This is the maximum of the four row minimums, and is called the maximin payoff. So, according to this criterion, GM should choose act A1, because it gives the best payoff under the worst conditions.

### C.2. Minimax Regret Criterion(Savage):

**Table 2-8:**

Alternative Act (Liters,Price)	O1 20000 liters	O2 40000 liters	O3 60000 liters	O4 80000 liters	Minimum Regret	Maximum Regret
A1	0	n.f.	n.f.	n.f.	0	0
A2	10	0	n.f.	n.f.	0	10
A3	20	10	0	n.f.	0	20
A4	30	20	10	0	0	30

n.f.: Not feasible

L. J. Savage suggested the construction of a *regret matrix* (Table 2-8) to replace the original payoff matrix, and an application of the minimax criterion to the regret matrix.

Suppose that the GM decides to use the minimax regret criterion. Referring to the before mentioned figure, one examines each outcome column in turn. In the O1 column, he sees the best payoff is the maximum profit entry \$10,000, corresponding to act A1. If any other act is chosen, the payoff under O1 will be worse, amounting to a lost opportunity of \$10,000 for A2, \$20,000 for A3, and \$30,000 for A4, respectively. The losses are calculated for each column in turn. Note that in each column, the loss corresponding to the best payoff is always zero; corresponding to all other payoff elements it is always zero or positive, never negative. Now the worst (maximum) loss is obtained for each row, as follows:

<u>Undominated Act</u>	<u>Worst (maximum) Loss</u>
A1	0
A2	10
A3	20
A4	30

The best of these four worst losses is \$0, corresponding to act A1. This is the minimum of the four rows maximums and is called minimax loss or the minimax regret. According to the minimax regret criterion, the GM should choose act A1, because it gives the smallest loss (regret) under the worst conditions. The minimax regret criterion is arbitrary, but it seems to have a particular psychological flavor, as well as a strict economic interpretation. It may be especially appealing to political decision makers.

### C.3. Criterion Of Weighted Extremes (Hurwicz):

Leonid Hurwicz suggested a simple criterion in which decision maker applies an arbitrary weight  $W$  to the best payoff and  $(1-W)$  to the worst payoff for each act, where  $W$  is a number between 0 and 1. In the example above, the best payoff is shown as a row maximum in Figure 1, and the worst payoff is shown as a row minimum. Then the weighted payoff for each act is given by the simple formula:

$$(1-W)(\text{row minimum}) + W(\text{row maximum})$$

One may think of the weight  $W$  as an "index of optimism", with  $W=1$  indicating extreme optimism about the outcomes and  $W=0$  indicating extreme pessimism. The weighted payoffs for the four acts in the example above are shown below, in Table 2-9, corresponding to several different arbitrary specifications of the weight  $W$ :

**Table 2-9:**

Alternative Act	W= 0	W=1/4	W=1/3	W=1/2	W=3/4	W=1
A1	10*	10*	10*	10	10	10
A2	0	7.5	2.5	15	22.5	30
A3	-10	5	10*	20	35	50
A4	-20	2.5	10*	25*	47.5*	70*

For each arbitrary  $W$ , the best (maximum) weighted payoff is denoted by an asterisk. Notice that act A1 is the best choice for any weight  $W$  between 0 and  $1/3$ . There is a step change at  $W=1/3$ , and then act A4 becomes the best choice for any weight  $W$  between  $1/3$  and 1. The Hurwicz criterion is arbitrary. When  $W=0$ , it amounts to the pessimist's maximin criterion discussed earlier, When  $W=1$ , it amounts to the optimist's maximax criterion.

#### **C.4. Theory of Games And Its Limitations:**

Conceived by John Von Neumann and Oskar Morgenstern, the theory of games was proposed for the modeling of competitive economic behavior, and more generally for the study of decision making in situations of conflict, coalition formations, and cooperation among players.

In general, a game may be described in terms of the following typical elements:

- 1- Two or more *players* or individual decision makers (a two-person game or an N-person game)
- 2- Two or more possible strategies for each player (choices of action on each play of the game)
- 3- Each player's *payoffs*, corresponding to the outcomes of actions by all the players, measured either *objectively* in terms of common physical or monetary units or *subjectively* in terms of personal utilities
- 4- The *rules* of the game, including, for example, the particular game situation, environment, information available, interpersonal communications allowed, coalitions and collusive actions allowed, and stopping rules
- 5- The *objectives or motivations* of each player (e.g., maximin payoff conflict avoidance, deterrence, punishment of opponents, greed, etc.)

Before proceeding further, it is important to note that most of the qualitatively useful results of game theory are based on two-person games. N-person games, with multiple possible strategies and multiple coalition opportunities, pose mathematically intractable combinatorial problems. Hypotheses about the behavior of multiple players are extremely difficult to test empirically because of the complexities of designing and implementing appropriate multifactor experiments to generate the data required, even when objective payoff measures are specified. Empirical testing becomes virtually impossible when individual personal utilities are contemplated as payoff measures.



### **C.4.1. Strategic Structure Of Games:**

The types of two-person games are as follows:

- 1- Zero-sum games with stable single strategy *maxmin* solution
- 2- Zero-sum games with stable mixed-strategy solution based on *maximizing expected values*
- 3- Non-zero-sum games with mixed motivations and paradoxical solution criteria

The zero-sum games require objective payoff measures, are applicable in relatively few hypothetical situations, and are relatively simple from a decision-analysis viewpoint. The non-zero-sum games may have either objective payoff or subjective utility measures, are applicable in relatively more hypothetical situations, involve mixed motivations of players, and are relatively difficult and interesting from a decision-analysis viewpoint. All of the games become extremely difficult in the N-person versions, especially non-zero-sum N-person games.

### **C.4.2. Zero-Sum Games with Maxmin Solution:**

For convenience let us call the two players Sally (S) and Tex (T). Let us designate Sally's possible strategies by  $S_1, S_2, S_3, \dots, S_m$  and Tex's possible strategies by  $T_1, T_2, \dots, T_n$ . Suppose that they play a game of skill in which each has complete information about the payoffs, as shown in the following figure:

**Sally's Payoff Matrix**

	T1	T2	Minimum
S1	-8	-9	-9
S2	+3	-3*	-3
S3	+11	-7	-7

**Tex's Payoff Matrix**

	T1	T2
S1	6	+7
S2	-5	+1*
S3	-13	+5
Minimum	-13	+1

For example, if Sally chooses S2 and Tex T1, then Sally gains \$3 and Tex loses \$5, giving a sum of (-2) dollars. Similarly, if they play S3 and T2 then Sally loses 7 and Tex gains 5, again giving a sum of (-2). It can be seen that the sum of payoffs is (-2) for any combination of strategies. This is a constant-sum game. If +1 is added to each cell in each matrix, then it becomes a zero-sum game (e.g. Sally's loss is Tex's gain and vice versa, and each incurs a cost of +1 to play the game).

Corresponding to Sally's selection to strategy S1, S2, or S3, her minimum (worst) payoffs will be -9, -3, and -7 dollars, respectively. The maximum of these minima is -3, corresponding to S2. Similarly, corresponding to Tex's selection of T1 or T2, his minimum (worst) payoffs will be -13 or +1, respectively. The maximum of these minima is +1, corresponding to T2. Both Sally's maxmin payoff of -3 and Tex's maxmin of +1 correspond to the selection of the same pair of strategies (S2, T2). In this case (S2, T2) is called a saddle point, and the pair of

payoffs (-3, +1) is called a saddle-point solution, as shown by asterisks in the payoff tables.

If both Sally and Tex are rational, then each will adopt a maxmin strategy. If either one adopts a different strategy, she or he will lose more or gain less. It would be irrational for both to deviate from the saddle point.

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## Chapter 3

### Research Design and Methodology

#### **A. The Basic Approach**

The main objective of this project is to determine whether the key issues in following a structured decision-making process are being considered in Lebanese businesses or not. How many of the principles identified in the Literature presented in chapter 2 are applied in Lebanese businesses? To achieve a comprehensive assessment of the decision-making process, in our area of concern, a thorough search for relevant information is conducted. This chapter states the way followed to collect data in addition to an explanation about the structured questionnaire designed for this purpose. A quantitative organizational research resembles a systematic approach in conducting a research. Such an approach makes intensive use of structured interviews and questionnaires which allow the researcher to question people about their own behavior and their perception of various aspects of their environment. Since the decision making process rests mostly on top level managers, then conducting structured interviews with those managers will be the most efficient way for gathering the information concerning how they deal with such a process in their companies. Other interviews will be made with lower level managers in case they participate in the decision making process.

## **B. The Practice For Data Collection**

“Structured interviews is a highly structured approach to gathering data on fairly to very large number of respondents. In many respects, the structured interview is simply a questionnaire that is administered in face-to-face setting” (Bryman, 1989).

The approach to data collection for this thesis project is set in such a way so as top managers make responses as comparable as possible. Every respondent is asked the same questions presented in the same style and in the same sequence. Such a practice in data collection allows the process of questioning to be standardized, and consequently the differences in people’s responses can not be attributed to divergences in the order of asking questions, but to real variations among respondents’ practices.

The structured questionnaire designed to serve the purpose of this project would reduce any biases that might be encountered had the respondent filled or completed any application. Further, letting a manager fill a questionnaire by himself would not ensure that the latter had understood the framework prior to its use. Structured questions, clear and unambiguous, together with the interviewer, can help the respondent if a question is not understood. Then, in a structured interview the respondent is obliged to answer questions in their order format; respondents can not read the whole questionnaire and let answers to early questions be influenced by their knowledge of the latter ones.

Through this technique, a researcher would ensure that the manager is the source of data the former is after and not some other person. A structured interview allows for a combination and utilization of the full range of responses from all interviews, allowing for a reduction in individual bias, due to the personal exchange influences such as attitudes, perceptions, and values (Greenley, 1987). Finally, it should be noted that, through structured interviews, control could be exercised in ensuring that all the questions are fully answered.

### **C. Measures Used To Collect Data**

The field survey covers different businesses in Lebanon with remarkable market reputation. The data used in this thesis project involves completing personal interviews with responsible managers involved in the process of decision making. The questionnaire, as presented in "Appendix I", is the main tool followed to collect the data needed. The interview aims to highlight the following points:

- 1- Knowledge of managers and responsible people of key concepts related to the decision making process.
- 2- Decision making, is it a process or a statement to be executed?
- 3- The decision making group interaction.
- 4- Decision making techniques proposed versus those applied.
- 5- Subjectivity versus objectivity in decision making.
- 6- Reliability on computers in decision making.

## **D. Interview Questions**

### **D.1. Leadership (Questions 1 & 2)**

Leaders, like groups, vary in their characteristics. Different situations and circumstances require different functions to be performed if a group is to move closer to its goals. Leadership is viewed as a role that provides for vital group needs by exerting influence toward the attainment of group goals. Leadership is a process. It is present no matter who the individuals taking leadership role or what their influence.

The influence relationship is based upon motivations, perceptions, and resources relevant to the attainment of group's goal. The multiplicity of tasks and the variety of groupings in the complex social structure prompts a great deal of study and research in an effort to understand the nature of leadership, its proper function, and its various styles and types.

The researcher is interested in figuring out whether leaders are to hold official positions. Also whether if leadership, in Lebanese businesses, is a matter of having some personality traits or a certain management style (*laissez-faire*, autocratic, or democratic). Moreover, a point of concern to the researcher is whether a leader of a certain decision-making group can achieve leadership in any other group. Also, since group interaction is the core issue of this research, the researcher tries to point out the type of relationship that exists between leaders and their subordinates in Lebanese businesses.

**D.2. Decision Making: A clear concept (Questions 3, 4, & 5)**

For the researcher to discuss decision-making with managers, it was important to make sure that both sides were aware of the real meaning of decision making. That is, the researcher is interested in knowing whether the Lebanese managers consider decision-making as a process consisting of several steps or not. Also, if the availability of alternatives is a critical issue in the operation or not. Moreover, a point of interest is the relationship between “decision-making” and “problem-solving”: Do Lebanese managers consider these two terms as synonymous?

**D.3. Decision-Making as a Process (Questions 6 & 7)**

The researcher tries to figure out the way that Lebanese managers and decision makers approach in formulating their decisions. If the latter consider decision-making as a process, are they aware of the “right” phases this process entails or they leave for the events to lead them? The researcher aims to contrast the theoretical approaches to decision-making against practical ones followed in Lebanese businesses. He tries to figure out to what extent theory can be practical in day-to-day business practices.

**D.4. Group Interaction (Questions 8,9,10, 11, and 12)**

Through these questions the researcher tries to “dig” into meetings of the decision-making groups. It is necessary to find out how group members interact with each other. Also, it is necessary to know if “identification of mutual concerns”, within a group, is considered to be a critical phase before studying or making a decision. This is because if people are to do something, about certain



feelings or ideas they have in mind, by group action the first step would be to ascertain the way others feel about it. "Others" may be potential members of a decision-making group. The judgment of their degree of concern should be validated. More important, if their concern is assumed without verifying the judgment, the hope for group action often may be frustrated.

After mutual concerns are identified, the researcher is interested in finding out the obstacles that are often encountering decision-making groups in their analysis phase. Their reaction to these problems is of importance to the researcher also.

Moreover, the researcher is interested to know whether Lebanese managers consider creativity in thinking to be a necessity for a more efficient decision-making process. If so, what techniques are used to enhance this necessity? After all, group members' commitment to task and group goals is of great concern to the decision-making process. The research aims to reveal the threats to this critical issue, encountered in Lebanese businesses. Not to end up with clashes among group members, and to keep the team spirit within a group, the opinion of those disagreeing with the opinion of the majority is thought of to be dealt with in a sensitive manner. For this very reason, the researcher meant to include mentioning this point and discuss with Lebanese managers.

Finally the researcher proposes a technique that is widely practiced in group meetings to free group members temporarily from inhibition, self-criticism, and criticism from others, in order to produce more imaginative alternative approaches to a specific problem: it is known as "brainstorming". The researcher tries to see how managers treat the problems just mentioned. And if they are not aware of them, what would be their corresponding evaluation of such a technique.

**D.5. Proposed Theoretical Techniques (Questions 13, 15, & 17)**

The researcher tries to figure out the degree of correspondence between the actual followed tools for decision making in Lebanese businesses and those presented in books and articles. He also wants to find out if businesses favor quantitative techniques or the analytical ones in decision making.

**D.6. Subjectivity Versus Objectivity in Decision Making**

In an attempt to find out whether Lebanese managers are professional in their decision making techniques and in the ways they run their businesses, the researcher aims to find out the degree of objectivity in the former's adopted ways of management. Also the researcher wonders if the managers are aware of the drawbacks of being subjective in decision making.

**D.7. Computers and Decision Making**

The researcher finds it necessary to shed some light on technology to see if Lebanese managers are making the best use of it to come out with effective decisions. This question is necessary especially if we know before hand that a very high percentage of the former generation people in Lebanon (who are currently occupying the posts of managers and chief executives) are technology-avert.

### **E. Data Analysis Approach**

The researcher finds that the analysis of his findings can be best approached using **descriptive statistics**. It is an approach that refers to the transformation of the raw data gathered into a form that will make them easy to understand and interpret. Describing responses and observations is typically the first form of analysis. The calculation of averages, frequency distributions, and percentage distributions is the most common form of summarizing data. So, descriptive information is obtained by summarizing, categorizing, rearranging data.

The researcher should be taking advantage of the softwares available to facilitate descriptive analysis. These programs would easily convert data's original form to a format that is more suitable to perform data analysis: graphs and charts.

Finally, it is worth mentioning that no statistics related to the issues (that the researcher is concerned about) exist in the articles or the literature that was reviewed. That is why the researcher meant to present the frequencies and the corresponding percentages in his findings in order to create a mirror reflecting the current tendencies and approaches that Lebanese business managers follow in their decision making processes nowadays. Therefore, the data analysis of this research aims at reporting models and techniques already followed rather than suggesting decision models to be followed.

## Chapter 4

### Findings Of The Study

This thesis project is concerned with the assessment of decision-making techniques applied in Lebanese businesses. So, interviews were conducted with Lebanese top managers from different business sectors to have a wider view of this complicated issue, and see how business decision-making groups interact and the techniques they apply to come out with their decisions.

The interview-questions are set up in such a way so as to highlight the following characteristics concerning the decision-making group: 1) The comprehension of Lebanese managers of the right perception of a "group", a "decision", and everything that has to do with "decision-making", and "Group interaction." 2) The approach that Lebanese managers take in decision-making, whether it is a systematized process, or an action taken haphazardly. 3) The techniques applied in Lebanese businesses for decision making versus those introduced in the "literature review" in chapter two. 4) The willingness and ability of Lebanese managers to adopt fruitful and effective techniques to formulate a decision-making system, or even enhance it if it is already existing. 5) The degree of expertise and skill of Lebanese managers, and this is detected through the ratio of objectivity versus subjectivity in management. 6) The reliability and acceptance of Lebanese managers to technology and computers in decision-making.

It is worth mentioning that the researcher meant not to apply statistical tools like SPSS because he knew before hand that the corresponding statistical runs will generate insignificant output. This is due to the following reasons:

First, the sample may be small to show any variations in the answers collected. Second, most of the questions were given, somehow, the same answers by the respondents. This will be shown in the tables and charts presented in this chapter.

### **Results of the Research:**

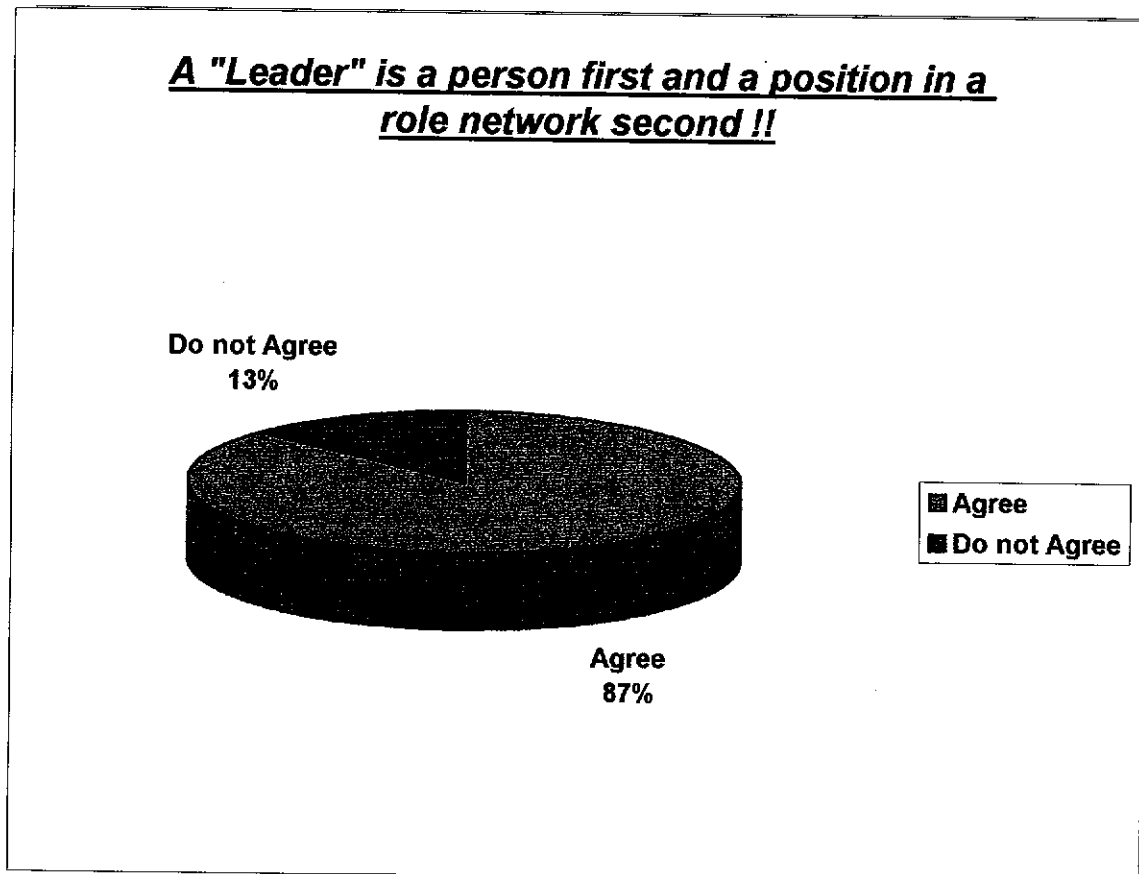
In what follows, the answers to every question in the interview will be summarized in the form of a table- showing frequencies of different answers and corresponding percentage- and a chart that reflects the findings in a clearer graphical presentation. Note that a number of thirty interviews were conducted. Also note that managers, in most of the questions, have given more than one specific answer to every question, and that is the very reason why the percentages would not sum to 100 in most of the cases. So, charts were plotted referring to the data under the “frequency” column and not the “percentage” column. Yet, this is very reasonable, for there is no “clear-cut” for answering the presented questions, and more than one answer could be leading to the same result.

### 1- A leader is a person first and a position in a role network second.

**TABLE 1:**

	Percentage	Frequency
Agree	87%	26
Do not Agree	13%	4

**CHART 1:**



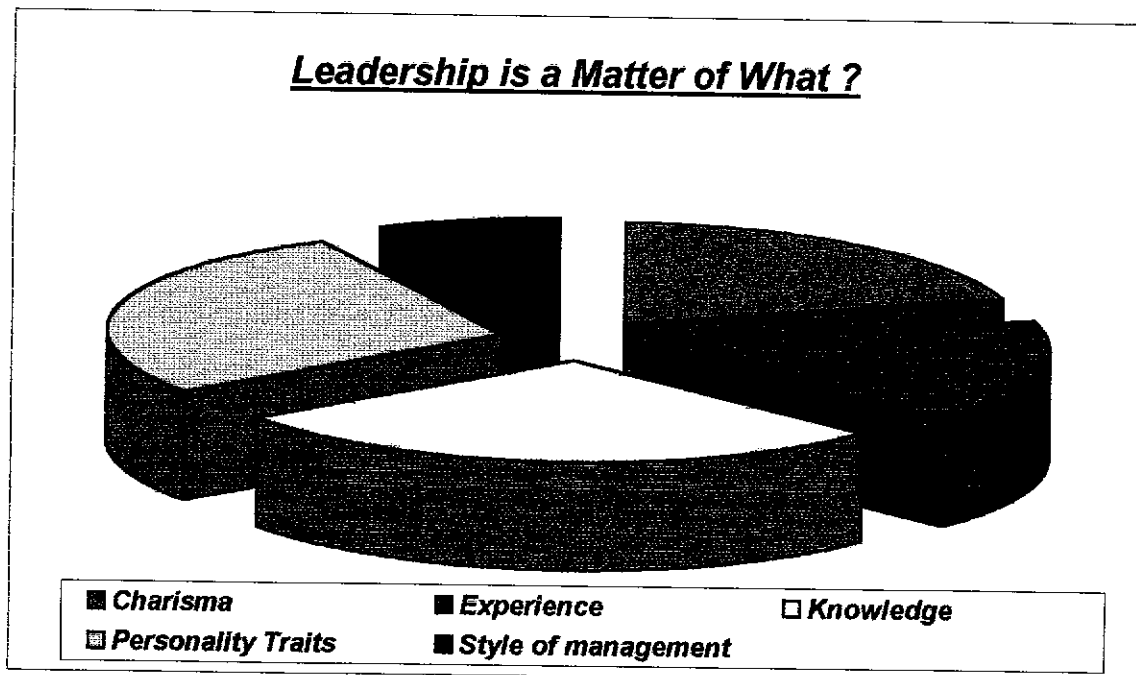
This question almost shows a comprehensive agreement among Lebanese managers that a leader is to be considered an individual first and a person of a certain position second. That is to say, leadership is a matter of certain characteristics summed up in a person whether he is an ordinary member of a decision-making group or he is the top executive of that group. At least this is what 87% of the respondents assured.

## 2- Leadership is a matter of :

**TABLE 2:**

	Frequency	Percentage
Charisma	22	73%
Experience	18	60%
Knowledge	30	100%
Personality Traits	30	100%
Style of management	8	27%

**CHART 2:**



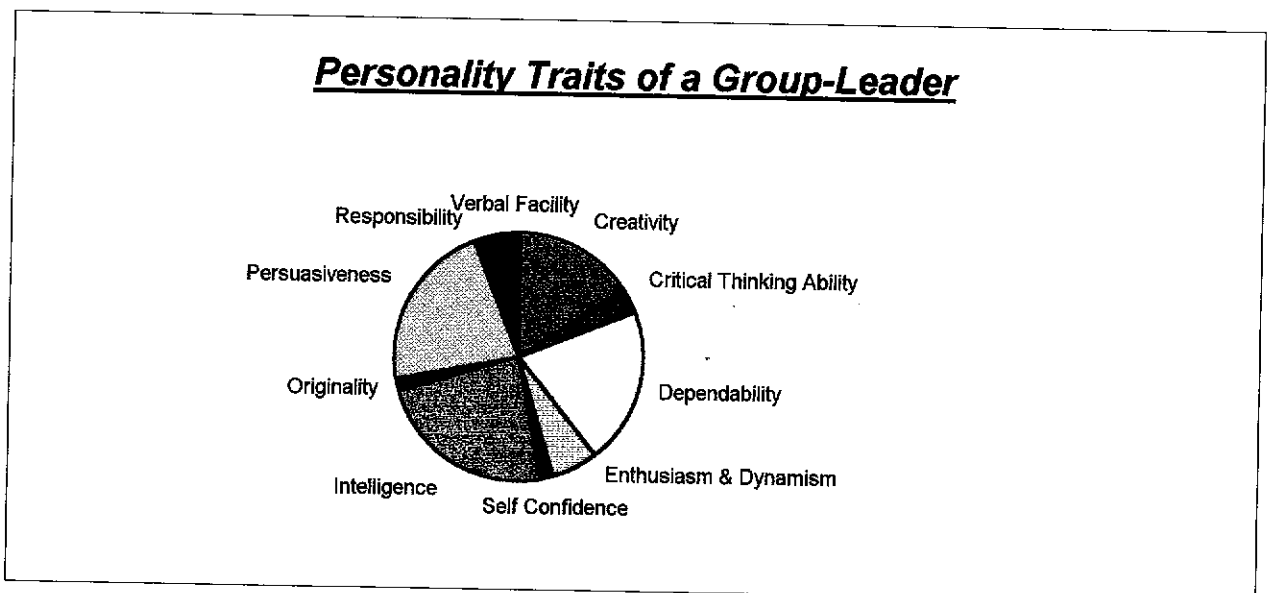
When asked about the characteristics that a person needs to be a successful leader, all managers agreed that leadership is not a matter of a single criterion, rather it is a combination of different characteristics. All agreed on the necessity of knowledge and personality traits. Ranking second was "charisma" with 73% of the respondents seeing it necessary. Whereas, 60% see experience contributing to leadership, and only 27% agreed that the style of management, whether it is "laissez-faire", "autocratic", or "democratic" has to do with leadership.

**3- Personality Traits that a group-leader should possess are:**

**TABLE 3:**

	Frequency	Percentage
Creativity	20	67%
Critical Thinking Ability	4	13%
Dependability	26	87%
Enthusiasm & Dynamism	8	27%
Self Confidence	2	6%
Intelligence	30	100%
Originality	2	6%
Persuasiveness	28	93%
Responsibility	6	20%
Verbal Facility	2	6%

**CHART 3:**



Since personality was found to do most with leadership, the researcher tried to find out what specific personality traits managers are trying to talk about. Intelligence was that one they all agreed upon. Then, "persuasiveness" with 93% agreement. 87% of managers emphasized "dependability" in leaders, and 67% assured the necessity for leaders to be creative. Yet only 27% talked about dynamism, and only 6% talked about self confidence, originality, and verbal facility. Also it is worth mentioning that only 20% talked about responsible leaders.

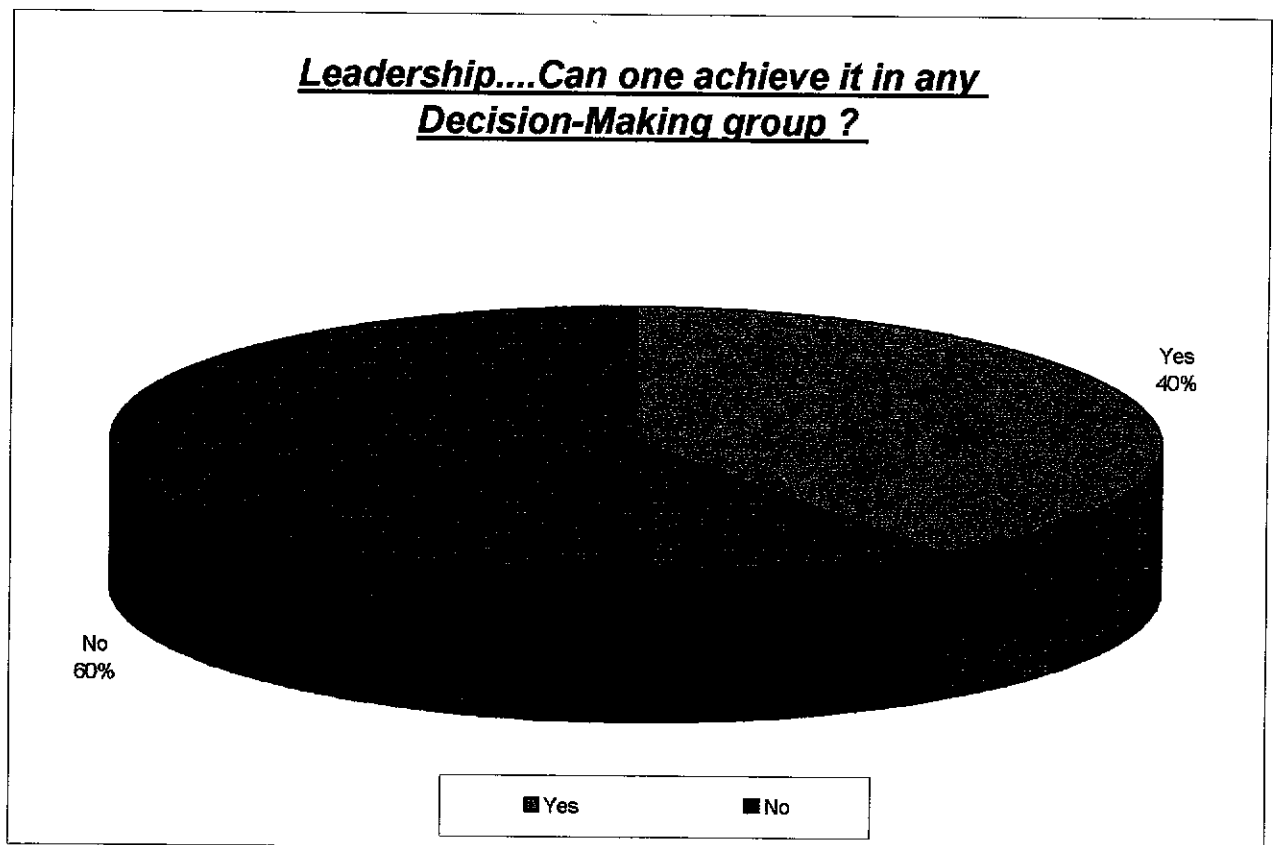


#### 4- A leader in one group can achieve leadership in any other group.

**TABLE 4:**

	Percentage	Frequency
<b>Yes</b>	<b>40%</b>	<b>12</b>
<b>No</b>	<b>60%</b>	<b>18</b>

**CHART 4:**



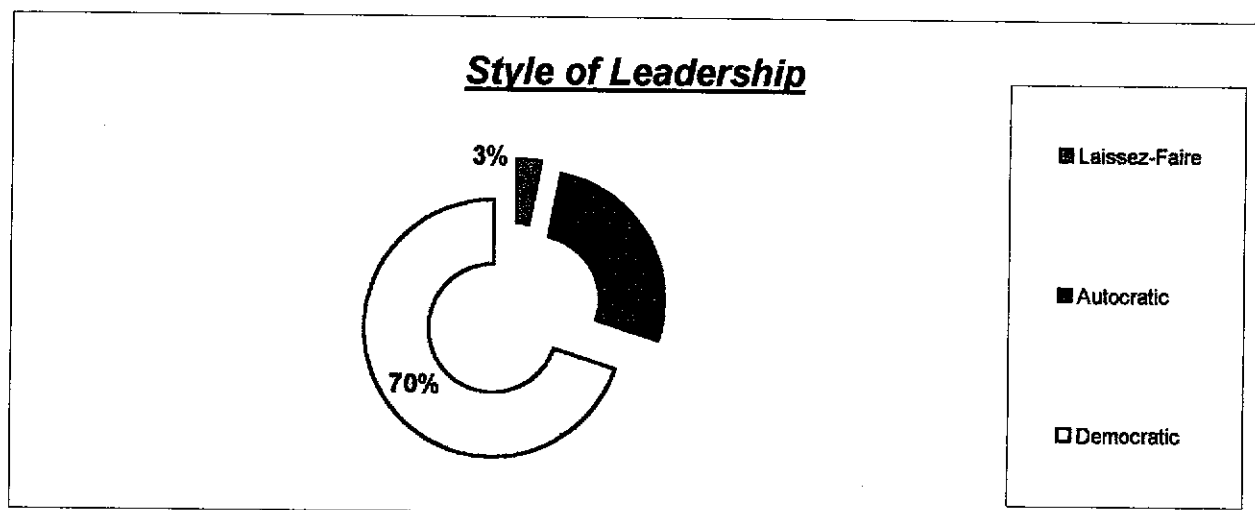
Only 40% of the respondents agreed that a leader of one group can achieve leadership in any other group. They thought that time is all what he needs. The disagreeing 60% thought that knowledge of the new business that the leader is transferring to is not an easy task, and that is why they can not be sure that the leader would attain leadership in any other group.

## 5- Which Style of Leadership is most effective in group decision-making?

**TABLE 5:**

	Percentage	Frequency
Laissez-Faire	3%	1
Autocratic	27%	8
Democratic	70%	21

**CHART 5:**



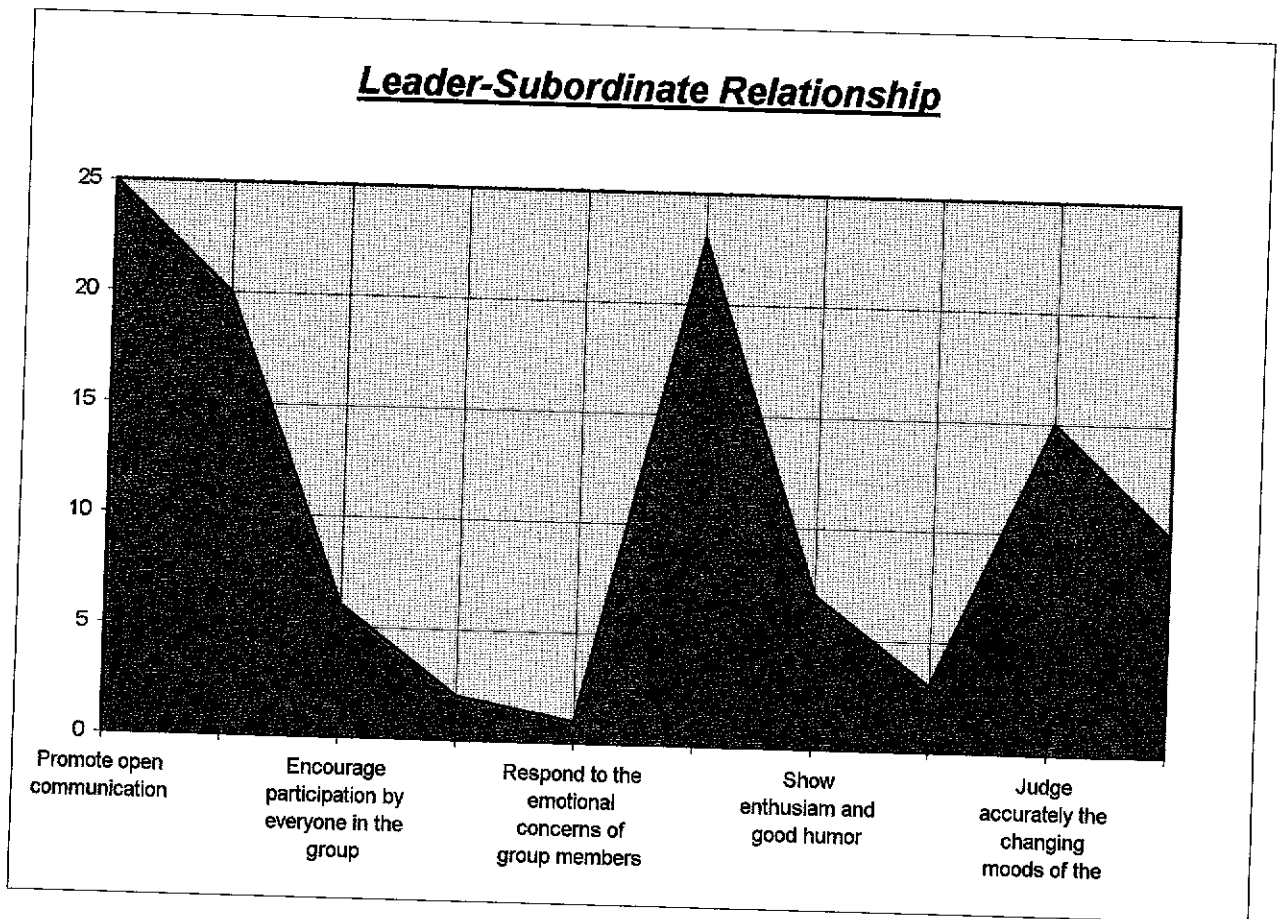
70% of the respondents were for "democratic" styles of leadership. They presumed that such a style proved to be the most efficient in all types of group work, whether we are talking about business or even politics. However, 27% of Lebanese managers promoted the "autocratic" type of leadership. They related it to being self-confident. Yet only one respondent was for the "laissez-faire" type of leadership for he thought that every one in the group should manifest his ideas in real business action.

**6- The quality of the leader-subordinate relationship should be stressed as an important determinant of productivity, morale, and other goals desired by the group. A leader should**

**TABLE 6:**

	frequency	percentage
Promote open communication	25	83%
Listen attentively to all contributors	20	67%
Encourage participation by everyone in the group	6	20%
Keep everyone in a friendly mood	2	7%
Respond to the emotional concerns of group members when that is appropriate	1	3%
Encourage with positive feedback	23	77%
Show enthusiasm and good humor	7	23%
Promote pride in the group	3	10%
Judge accurately the changing moods of the group	15	50%
Provide productive outlets for tension	10	33%

**CHART 6:**

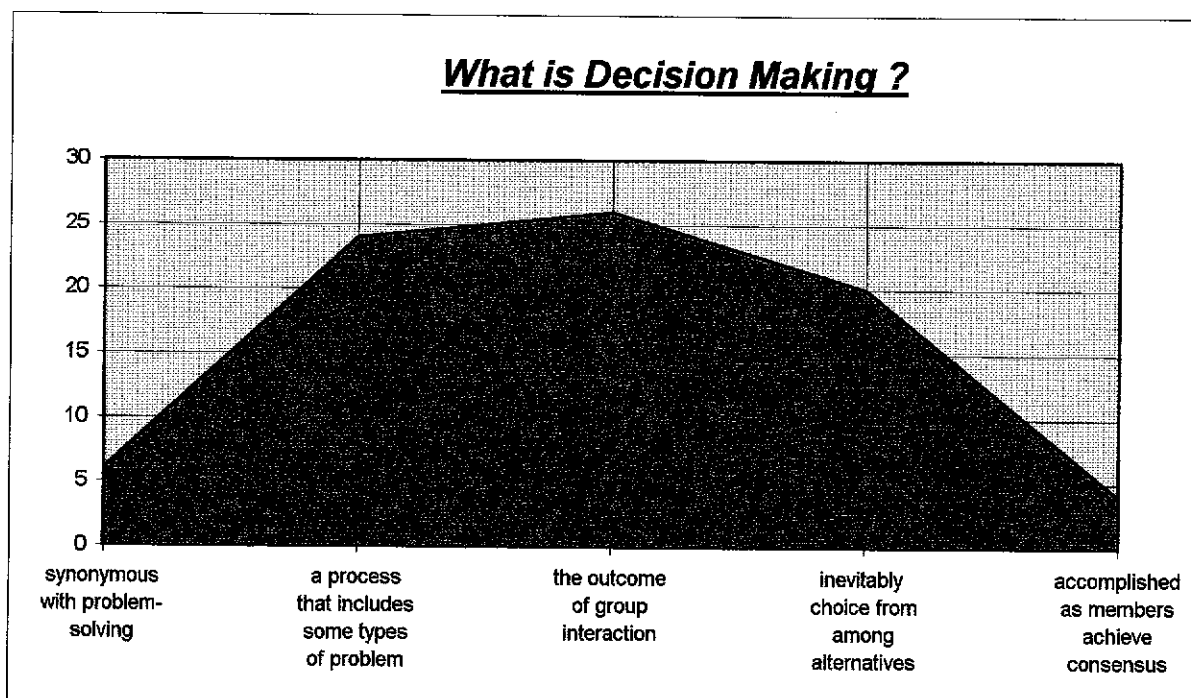


**7- Preliminary to any discussion of the group decision-making process, there should be a full understanding of "decision making" as a key term. Decision making is**

**TABLE 7:**

	Frequency	Percentage
synonymous with problem-solving	6	20%
a process that includes some types of problem solving and much more	24	80%
the outcome of group interaction	26	87%
inevitably choice from among alternatives	20	67%
accomplished as members achieve consensus on a proposal	4	13%

**CHART 7:**



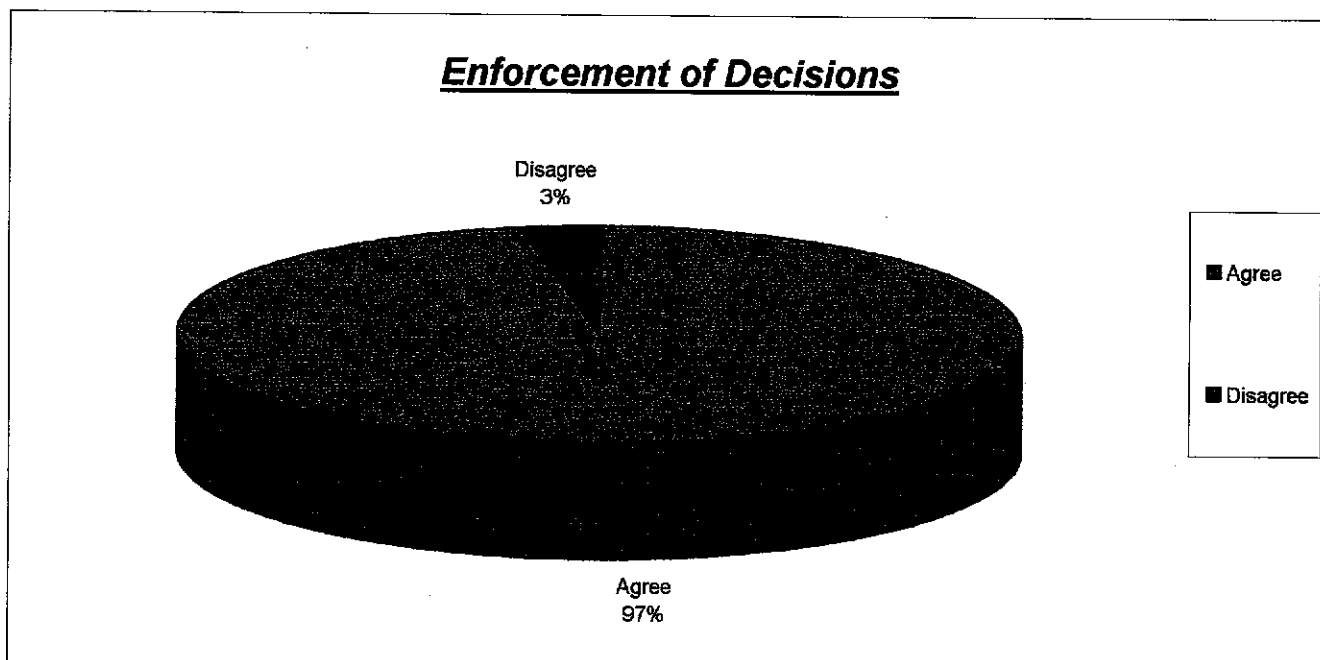
87% of the respondents declared that decision-making should be the outcome of group interaction. Group decision-making is much healthier than individual one. 80% said that it is a process that includes some type of problem solving, but it is not restricted only to problem solving. Only 13% of the respondents showed their comprehension of the term "consensus", and its importance in group interaction.

**8- Some decisions should be enforced by the group leaders or the highest-ranked person in the group.**

**TABLE 8:**

	Percentage	Frequency
Agree	97%	29
Disagree	3%	1

**CHART 8:**



Most of the managers (97%) agree that not all decisions can be done in groups. There many instances in which decisions should be taken on individuals basis. Some decisions should be taken on the spot; no time available for group meetings and discussions.

**9- When asked to formulate the decision-making process in a sequenced-ordered steps, two trends of approach emerged:**

**Trend I**

1. Agree on group goal
2. Analyze the nature of the problem
3. Suggest possible solutions
4. Compare solutions' payoffs
5. Implement Best Solution.

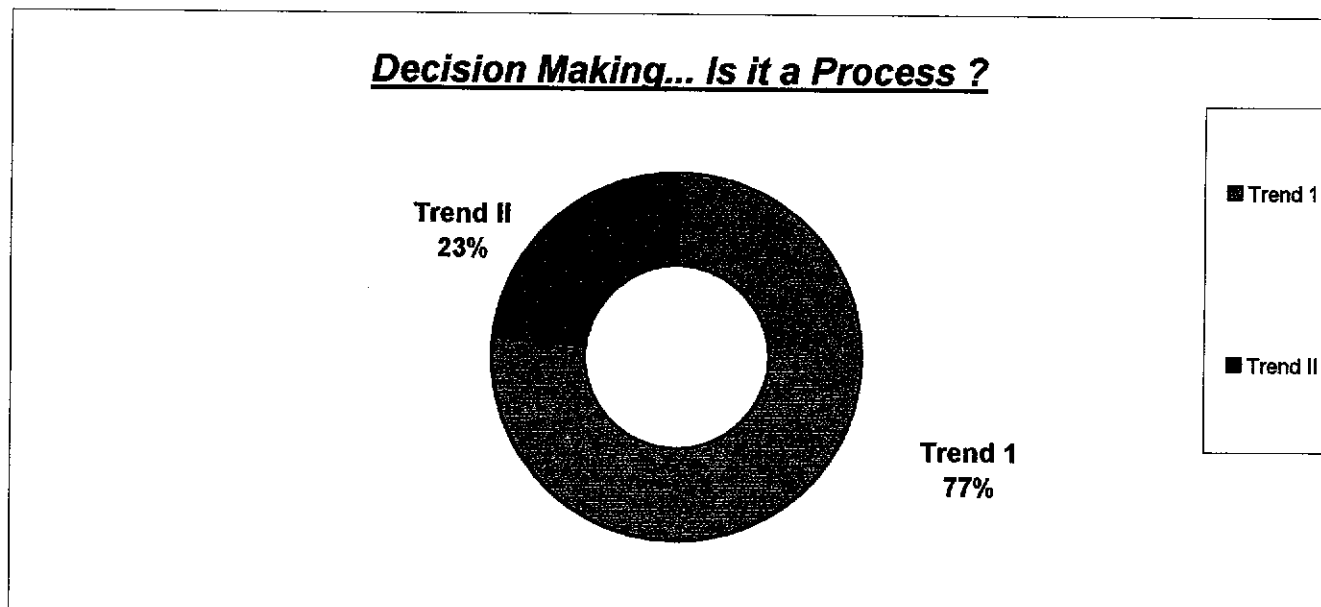
**Trend II**

No rational or organized approach.

**TABLE 2.**

	Frequency	Percentage
Trend 1	23	77%
Trend II	7	23%

**CHART 9.**



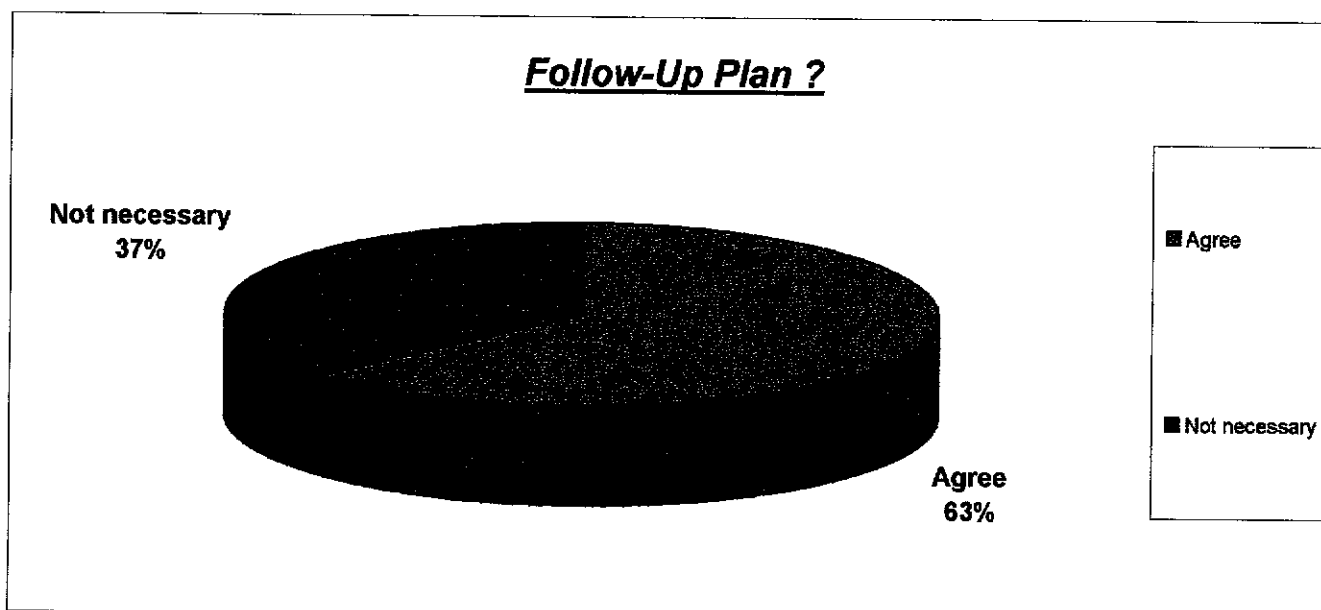
Most of the interviewed managers agree that decision-making is a process. 77% of the managers assure that decision making should be following a number of steps. Decision making is not an idea to be executed. It is far beyond that. Some managers (23%) think that decision-making is so complex that no predetermined approaches to it can be thought of.

### 10- A follow up plan should be ready after implementation of any decision.

**TABLE 10:**

	Percentage	Frequency
Agree	63%	19
Not necessary	37%	11

**CHART 10:**



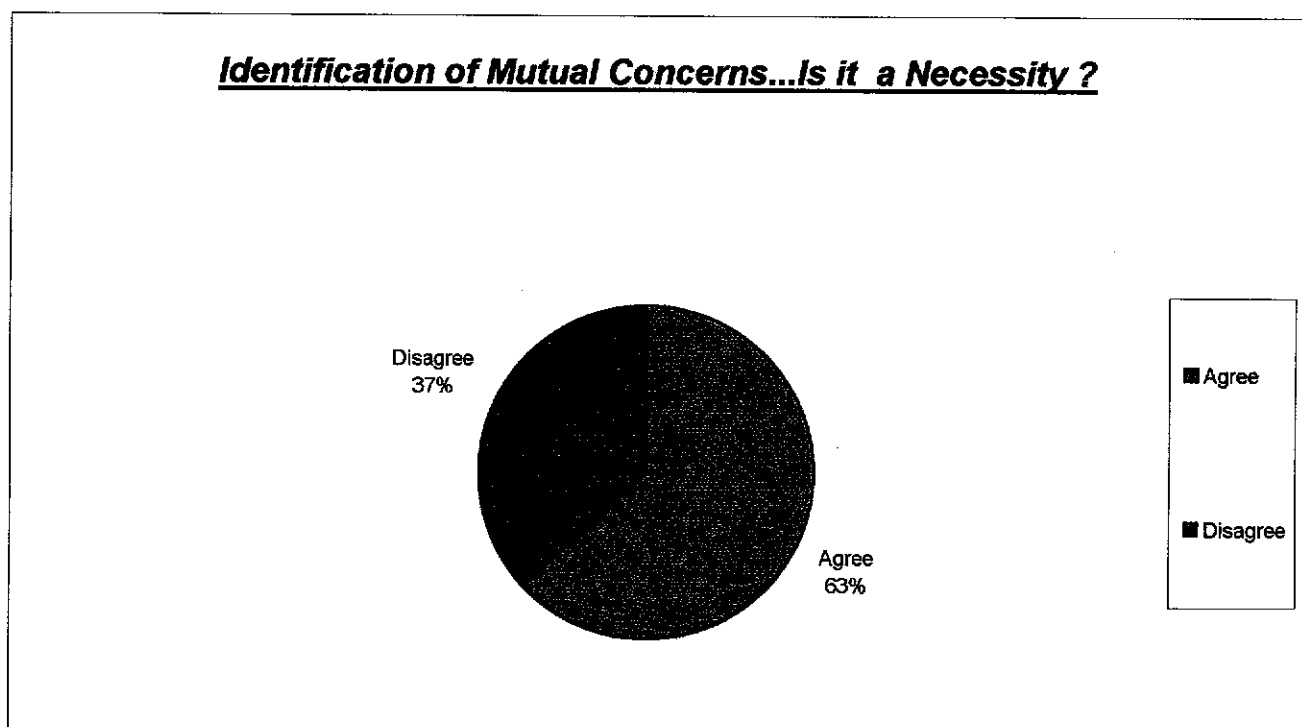
63% of the managers think that a follow-up plan for an executed decision should be ready. Such plans include evaluation of results and ensure the continuity of the business process. They think that business transactions are all linked; One cannot forget about any decision taken previously. Yet, 37% of the managers claim that they can afford moving from one decision to another with no follow-up.

**11- It is extremely important that members of a group check with each other on the nature of each individuals concern before they begin to try to find a solution to the problem.**

**TABLE 11:**

	Percentage	Frequency
Agree	63%	19
Disagree	37%	11

**CHART 11:**



63% of the interviewed managers agreed about the necessity that group members check with each other on the nature of each individual concern, so as to make sure that all members are thinking in parallel. Any deviation might lead to disappointing results of the decision to be made. However, 37% of the managers take this to be identified naturally, with no special effort from group members.



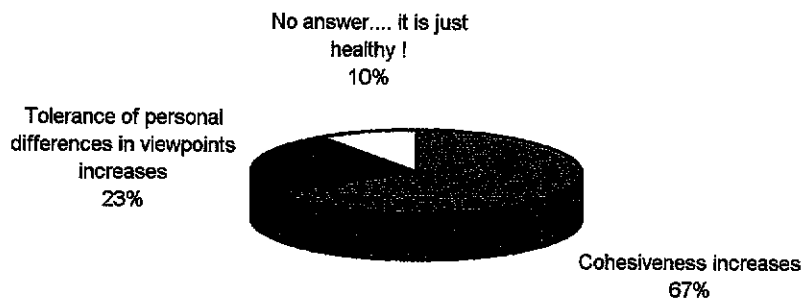
## 12- The advantages of "Identification of Mutual Concerns" are:

**TABLE 12:**

	Frequency	Percentage
Cohesiveness increases	20	67%
Tolerance of personal differences in viewpoints increases	7	23%
No answer.... it is just healthy !	3	10%

**CHART 12:**

### Advantages of "Identification of Mutual Concerns"



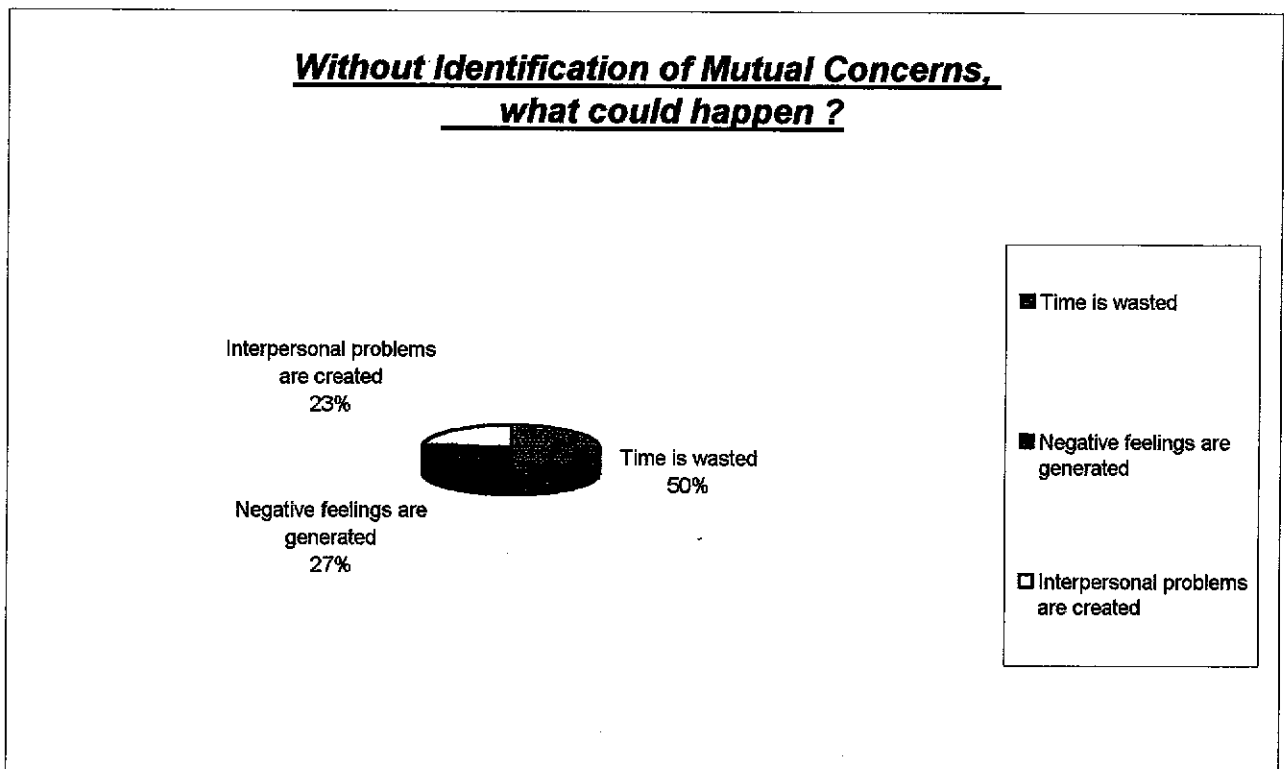
Those who viewed "identification of mutual concerns" as an essential step before trying to find solution to a problem justified this view for the following reasons: 68% of them said that this act would increase group cohesiveness, and 18% said that it would increase tolerance of personal differences in viewpoints. Whereas the rest gave no reasonable justification: they just said that it is positive!

### 13- Without "Identification of Mutual Concerns",

**TABLE 13:**

	Percentage	Frequency
Time is wasted	50%	15
Negative feelings are generated	27%	8
Interpersonal problems are created	23%	7

**CHART 13:**



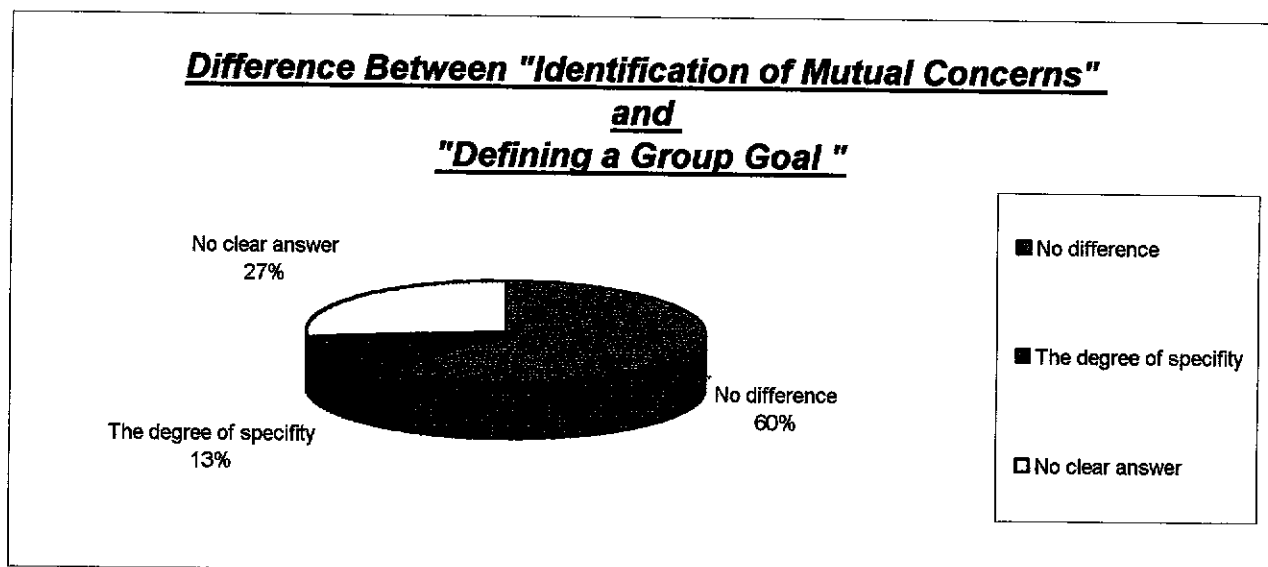
As for the disadvantages of ignoring the necessity of "identifying mutual concerns" within group members, 50% of the interviewed managers said that it would lead to time wasting, and 27% said that negative feelings among group members will be generated. Moreover, 23% of the managers said that some members will take things personal and this would lead to interpersonal conflicts between members within the group.

### 14- What is the difference between "sharing a mutual concern", and "defining a group goal" ?

**TABLE 14:**

	Percentage	Frequency
No difference	60%	18
The degree of specificity	13%	4
No clear answer	27%	8

**CHART 14:**



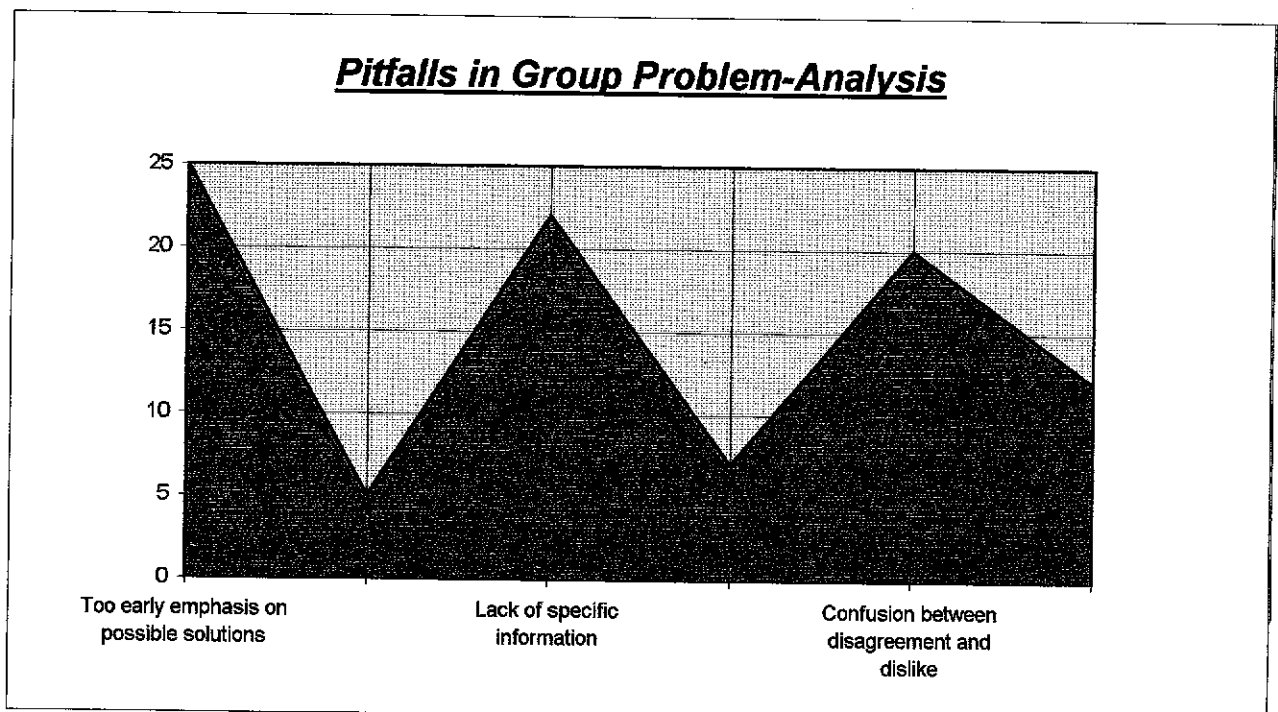
The researcher meant to check whether respondents are aware of the difference between "identification of mutual concerns" & "defining a group goal." It appeared that 27% gave no accurate response. 60% thought that there is no difference, and only 13% said that the degree of specificity between the two makes the difference.

**15- There are common pitfalls in a group problem analysis that help account for the difficulty that groups might have in reaching agreement. Some of these problems are:**

**TABLE 15:**

	Frequency	Percentage
Too early emphasis on possible solutions	25	83%
The assumption that truth will emerge	5	17%
Lack of specific information	22	73%
Frustration of group members	7	23%
Confusion between disagreement and dislike	20	67%
Predetermined solutions	12	40%

**CHART 15:**



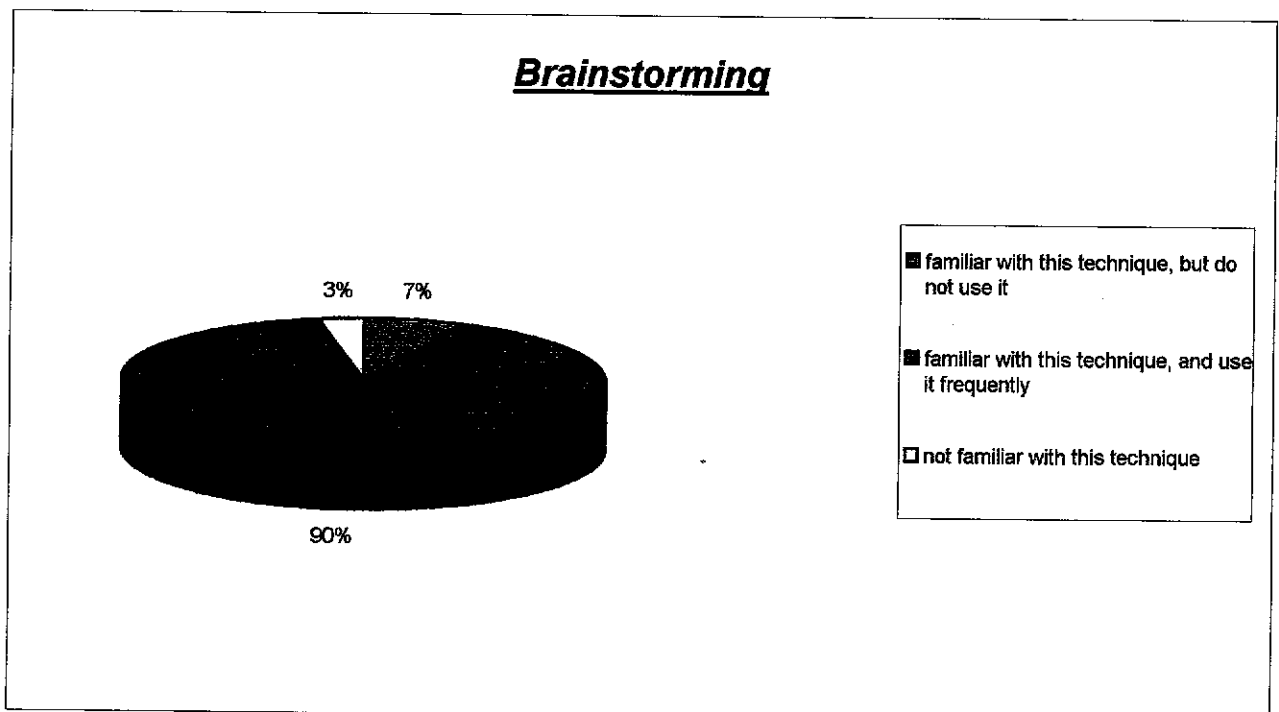
In an attempt to shed some light on the problems that decision-making groups face in their problem-analysis phase, it was found that 83% of managers face the problem of having group members emphasizing on possible solutions at an early stage. Lack of specific information seems to be the problem of 73% of the interviewed managers. Personal dislikes appears to be the problem of 67% of them. Problems could be the predetermined solutions, and frustration of members.

**16- A technique used to identify the possible approaches to a problem is called "Brainstorming". You, as a manager, are**

**TABLE 16:**

	Percentage	Frequency
familiar with this technique, but do not use it	7%	2
familiar with this technique, and use it frequently	90%	27
not familiar with this technique	3%	1

**CHART 16:**



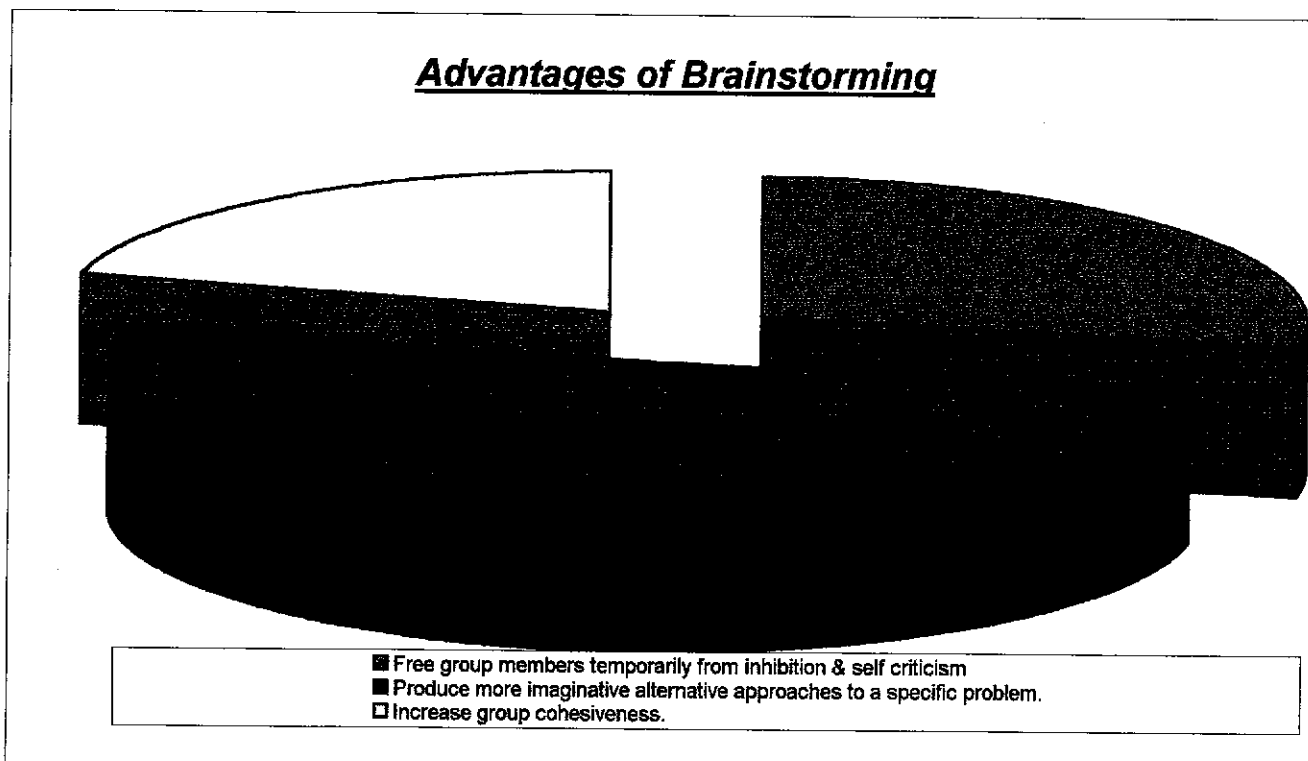
The researcher is interested in knowing the percentage of Lebanese managers who are familiar with "brainstorming" as a technique used to approach problems. Not only this, the researcher wants to know the percentage of the latter group who takes advantage of this technique. Amazingly, 90% were found to be using it frequently. 7% do not use it, and only 3% were not familiar with it.

**17- If you, the manager, are familiar with this technique, what do you think its advantages are ?**

**TABLE 17:**

	Frequency	Percentage
Free group members temporarily from inhibition & self criticism	16	55%
Produce more imaginative alternative approaches to a specific problem.	29	100%
Increase group cohesiveness.	12	41%

**CHART 17:**



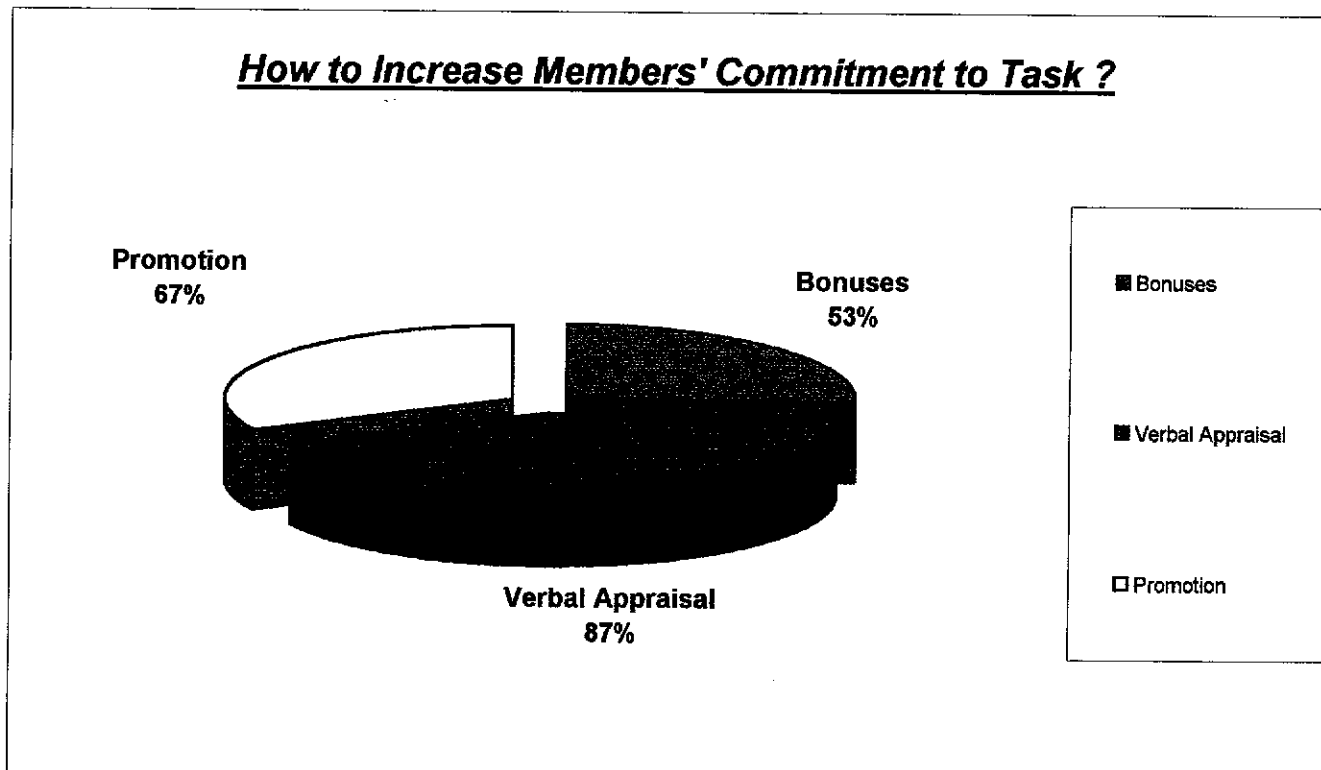
In an attempt to find out why users of "brainstorming" follow that technique, the researcher was able to find that all users believe that it produces more imaginative approaches to a specific problem. 55% believe that it frees group members from inhibition, self criticism, and criticism of others. 41% believe that it increases group cohesiveness.

## 18- What would be a good way of increasing members' "commitment to task" ?

**TABLE 18:**

	Frequency	Percentage
Bonuses	16	53%
Verbal Appraisal	26	87%
Promotion	20	67%

**CHART 18:**



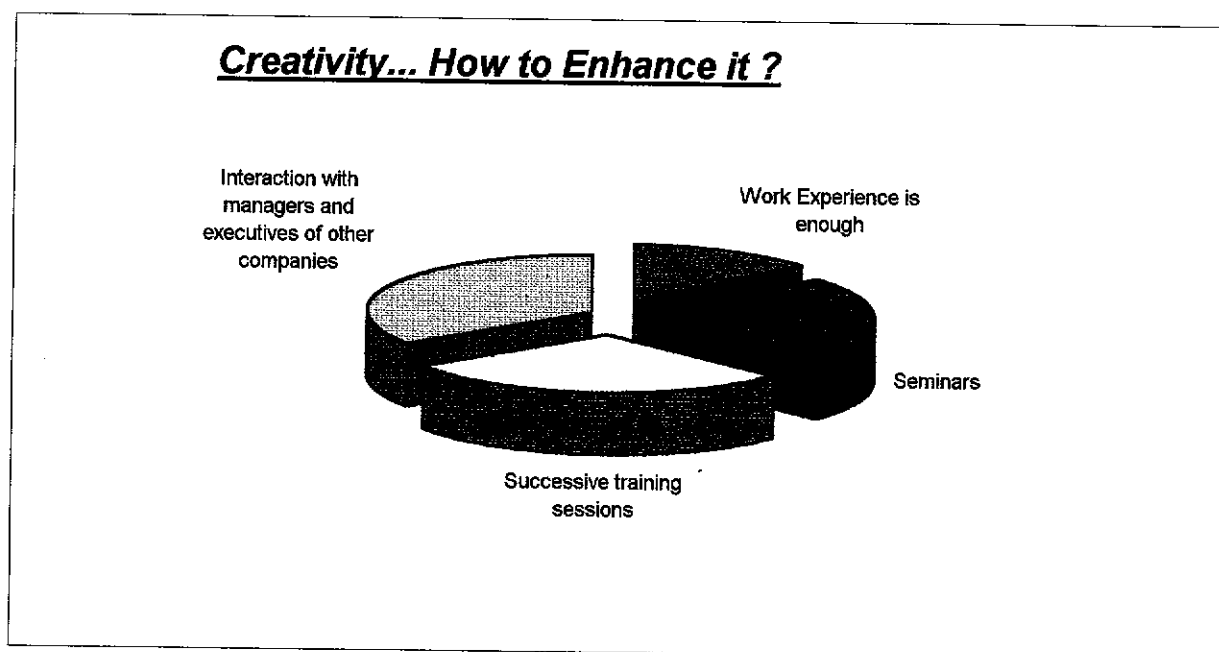
It was found out that verbal appraisal is what 87% of the managers think would increase members' commitment to their tasks. 67% emphasized the importance of promotion and 53% mentioned bonuses as the way to increase one's commitment to task.

## 19- What would be a good way to increase members' creativity ?

**TABLE 19:**

	Frequency	Percentage
Work Experience is enough	7	23%
Seminars	12	40%
Successive training sessions	15	50%
Interaction with managers and executives of other companies	18	60%

**CHART 19:**



4 ways were suggested by Lebanese managers to enhance group members' creativity: 60% were for the interaction with other companies' executives; 50% were for successive training sessions; 40% were for local and regional seminars, and only 23% believed that the work experience they are gaining is enough.

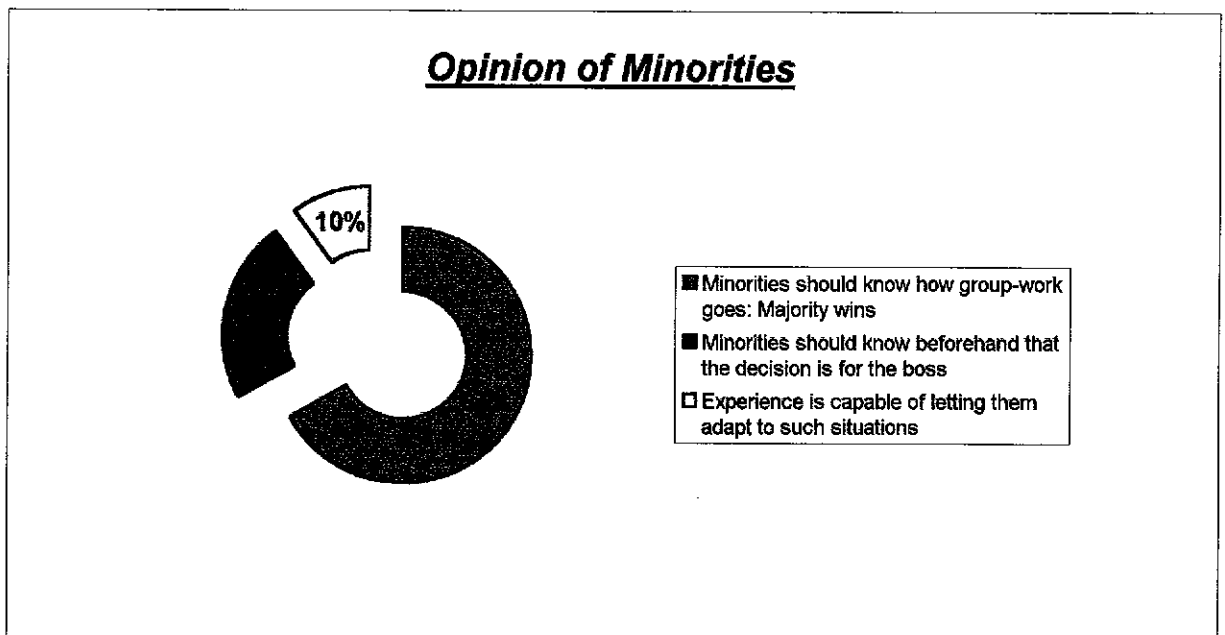


## 20- In what way should a manager, or group leader, deal with the group members who oppose the opinion of the majority of group members ?

**TABLE 20:**

	Percentage	Frequency
Minorities should know how group-work goes: Majority wins	67%	20
Minorities should know beforehand that the decision is for the boss	23%	7
Experience is capable of letting them adapt to such situations	10%	3

**CHART 20:**



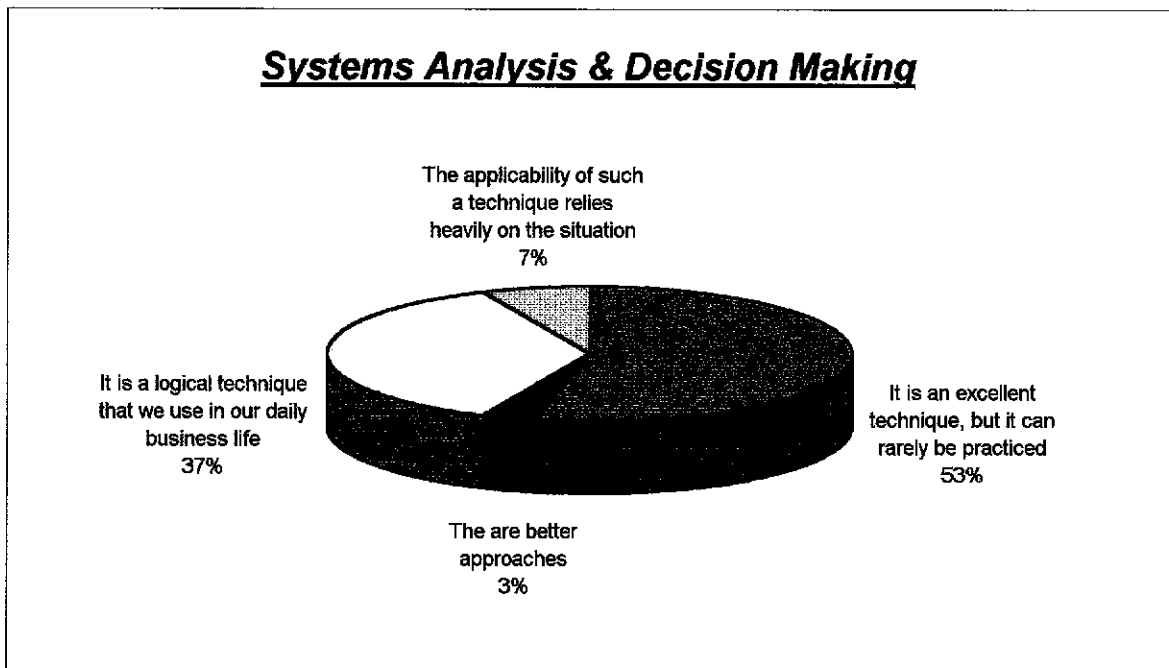
To shed some light on group interaction, the researcher wondered how managers deal with the opinion of minorities within their groups. It was found that 67% take it for granted that those who oppose the decision of the majority should know before hand that in group work it is the majority who *wins*. 23% have know problem for their group members already know that the decision is not theirs for sure. The rest hope that experience would be capable of letting minorities get used to it.

21- A technique to teach decision makers to think in a special, orderly, and thorough way is called "Systems Analysis". It follows the following phases: 1- Formulation; 2- Search; 3- Evaluation; 4- Interpretation; 5- Verification of results. What would your evaluation, as a manager, of this technique be ?

**TABLE 21:**

	Frequency	Percentage
It is an excellent technique, but it can rarely be practiced	16	53%
The are better approaches to decision making that we apply	1	3%
It is a logical technique that we use in our daily business life	11	37%
The applicability of such a technique relies heavily on the situation	2	7%

**CHART 21:**



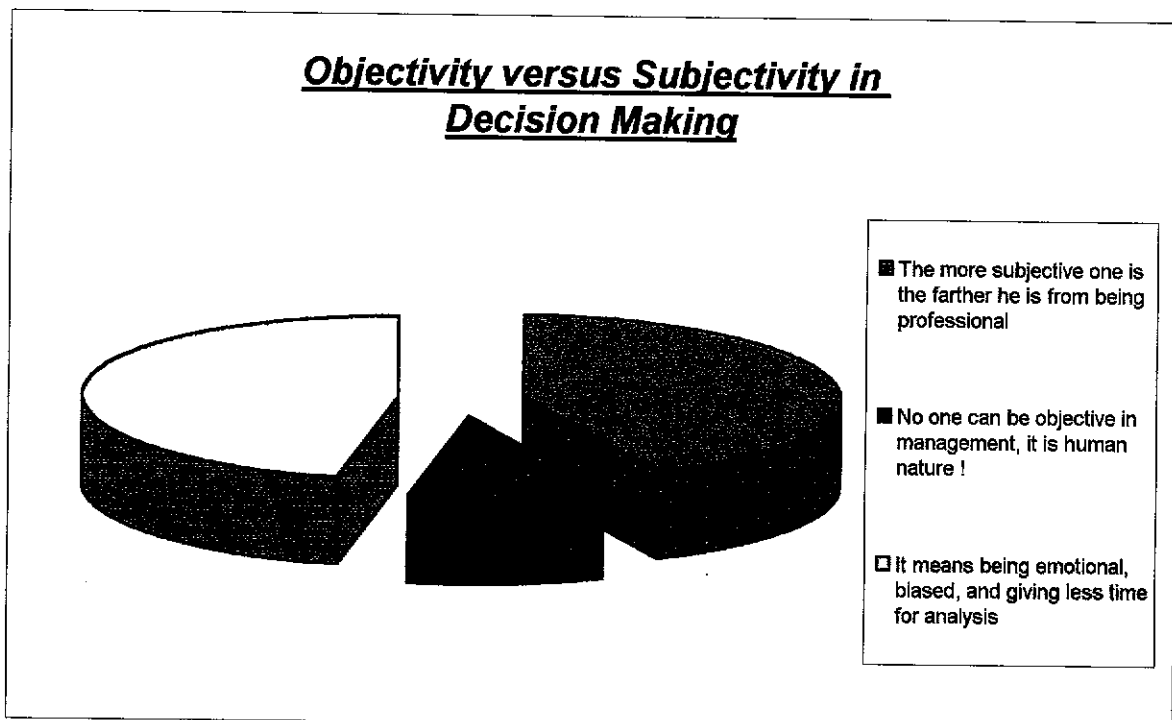
To see how much Lebanese businesses apply systematic approaches for their decision making, the researcher introduced "Systems Analysis" to them. 53% said that it is excellent, but it cannot be applied. 37% claimed using it in their daily business life. 7% refused to generalize the applicability of this technique 3% just said that there are better approaches.

## 22- What do you think about subjectivity in decision making?

**TABLE 22:**

	Frequency	Percentage
The more subjective one is the farther he is from being professional	22	73%
No one can be objective in management, it is human nature !	5	17%
It means being emotional, biased, and giving less time for analysis	24	80%

**CHART 22:**



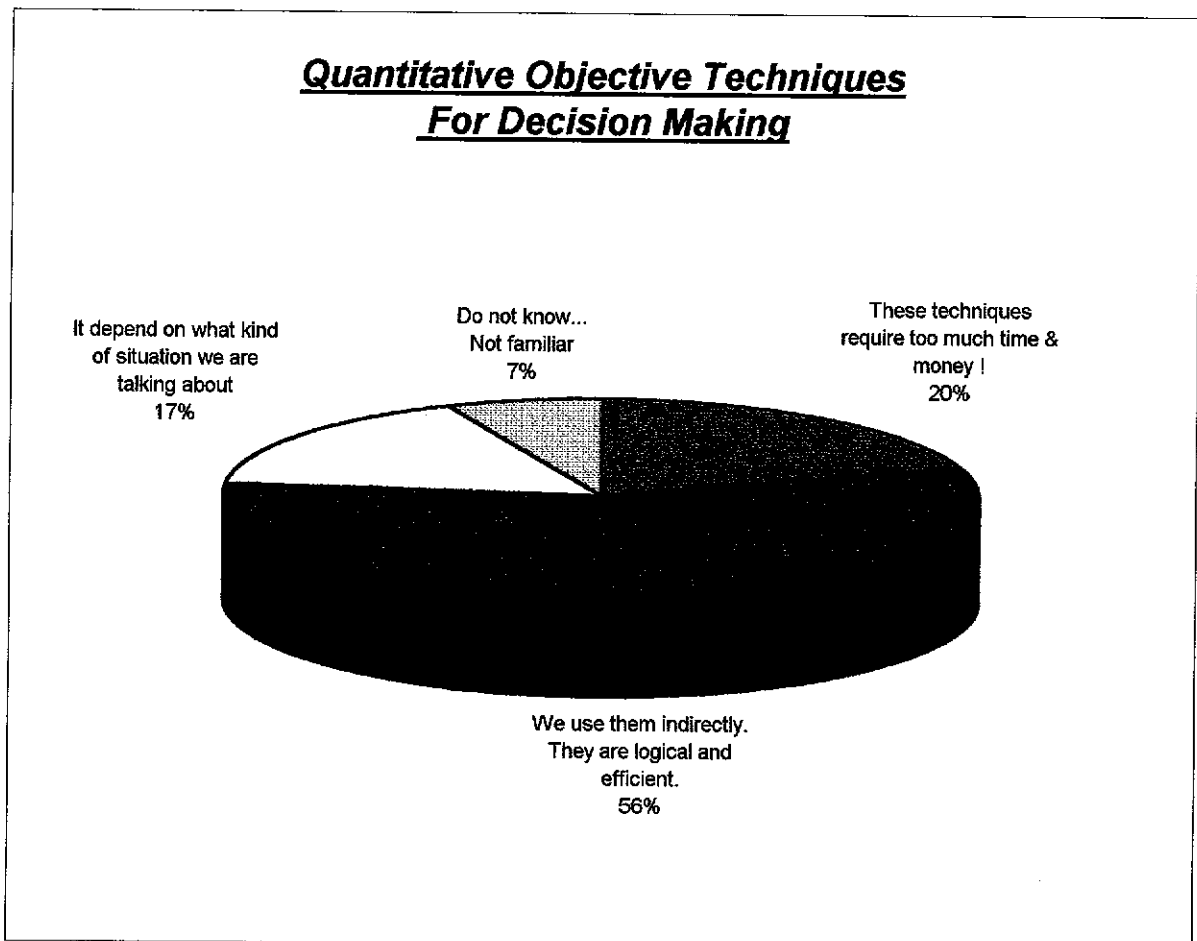
80% of the respondents agreed that a professional decision maker should not be subjective in management. Being subjective is being emotional, biased, and giving less time for problem analysis. 73% assured the fact that a subjective manager can not be a professional one. Yet, 17 % of the interviewed managers agreed that it is impossible to be objective 100%, it is human nature !

**23- What do you think about quantitative objective techniques for decision making? (techniques like minmax, maxmin, hurwicz alpha, game theory, ...etc.)**

**TABLE 23 :**

	Frequency	Percentage
These techniques require too much time & money !	6	20%
We use them indirectly. They are logical and efficient.	17	57%
It depend on what kind of situation we are talking about	5	17%
Do not know... Not familiar	2	6%

**CHART 23 :**



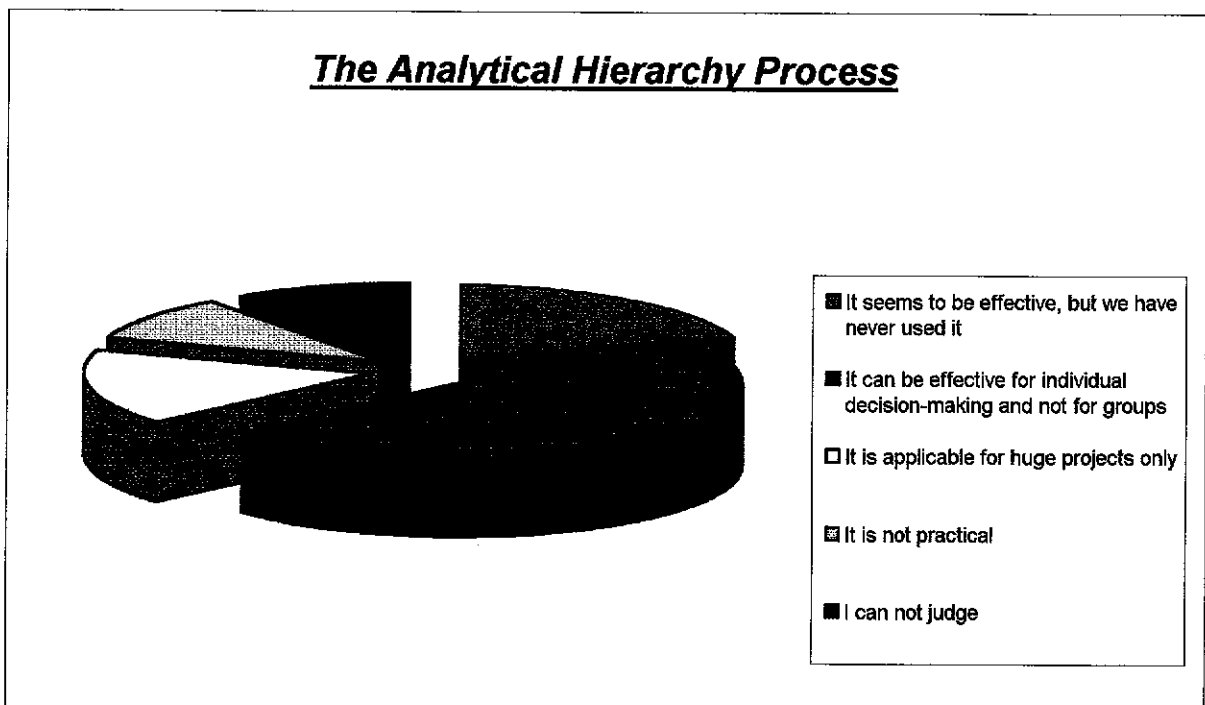
In an attempt to see how much Lebanese businesses rely on objective quantitative techniques in decision making, the researcher was able to find out that 56% of the respondents claim their usage of such techniques even though they are not familiar with the techniques' corresponding names. 20% assured that they do not use them for their time and cost requirements. 17% related the usage to the situation they are concerned about. 7% were unable to figure out the meaning of quantitative techniques.

## 24- What do you think about the Analytic Hierarchy Process in Decision Making?

**TABLE 24 :**

	Frequency	Percentage
It seems to be effective, but we have never used it	6	20%
It can be effective for individual decision-making and not for groups	13	43%
It is applicable for huge projects only	5	17%
It is not practical	3	10%
I can not judge	3	10%

**CHART 24 :**



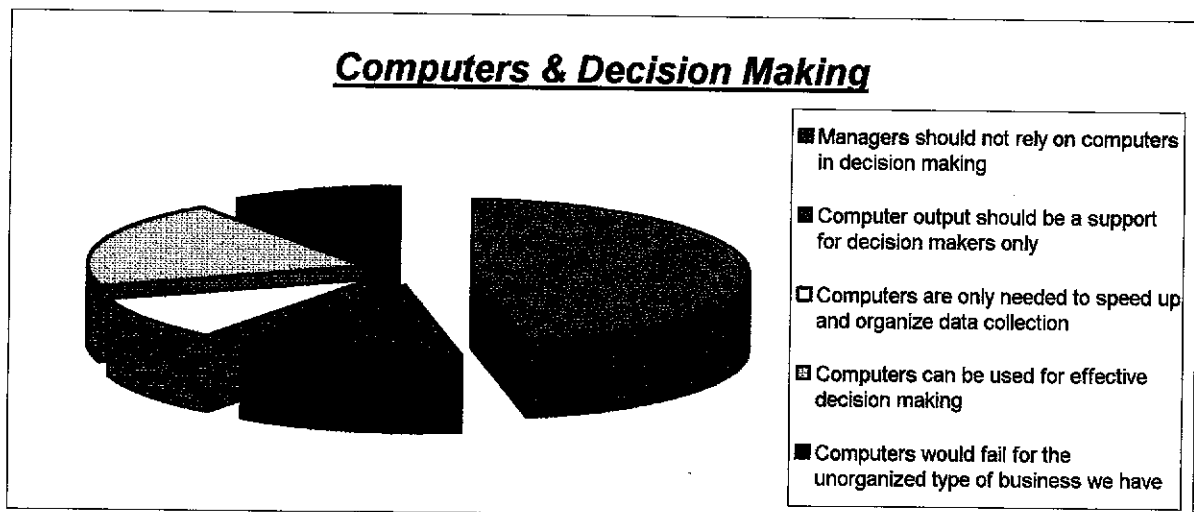
The Analytical Hierarchy Process is one of the famous techniques applied in different international businesses for complex problems. After thorough explanation of this technique, 43% of the respondents said that it can only be applied for individual decision making, 20% said that it can be effective and they need to give it a second thought. 17% regarded it as being efficient only for huge projects. 10% saw it impractical, and the remaining 10% refused to give their evaluation.

## 25- To what extent should managers rely on computers in the decision making process ?

**TABLE 25 :**

	Frequency	Percentage
Managers should not rely on computers in decision making	14	47%
Computer output should be a support for decision makers only	4	13%
Computers are only needed to speed up and organize data collection	3	10%
Computers can be used for effective decision making	6	20%
Computers would fail for the unorganized type of business we have	3	10%

**CHART 25 :**



For this age is that of technology, and because competition relies too much on speed and innovation, the researcher finds it necessary to see how much managers rely on computers in decision making. 47% of the Lebanese managers showed their aversion towards computers and said that businesses should not rely on computers in decision making. 20% showed enthusiasm and willingness to use computers in the decision making process. Only 13% emphasized that computers are highly recommended to organize and speed up data generation. 10% believe that it is impossible to use computers as long as Lebanese business trends are unorganized.

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## Chapter 5

### Conclusion And Recommendation

It has been a pleasure for the researcher to work on this study in which he has generally given a fairly comprehensive account of some important aspect of group decision making, rather than merely interpreting results from this study. Thus, the researcher, believes that this thesis project provides an up-to-date survey of theoretical notions as well as empirical findings concerning important issues in group decision and related social processes which are currently salient in the Lebanese business world.

#### **A. The Decision Making Group:**

Although decision making is the title of this research, yet the researcher has put the group-context in mind all through his work. He tried to attack this issue from its different aspects hoping to find out the different factors that might affect the emergence of any decision. Why “groups” and not “individuals” ? Are groups or individuals better at performing tasks ? Suppose it were true that groups do not perform tasks as well as individuals. There would be little motivation to form groups at all, and there will be little reason for scientists and researchers to study group process. People should not hastily reach the conclusion that groups definitely perform tasks better than individuals. Working in groups is found to lead to the following outcomes<sup>1</sup> :

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<sup>1</sup> Charles Pavitt & Ellen Curtis, Small Group Discussion, Gorush Scarisbrick Publishers, Scottsdale, Arizona (1994), page 18

- 1- More total productivity**
- 2- Less productivity per person**
- 3- Increased odds that a group member will propose an accurate answer**
- 4- Greater odds that the entire group will not accept an accurate answer**
- 5- Slower work.**

So, comparing outcome one with outcome two, and outcome three with outcome four, shows the ways in which the advantages and disadvantages of increased group size, can mirror each other.

What could be an ideal group size? There is a tradeoff between speed and quality in decision making groups. As a group size increases, quality increases at the expense of speed. If quality is the foremost goal, one may want a group of seven or more people. In contrast, if speed is most important, the group should have four or fewer members. In conclusion, it can be said that decision making tasks have no objectively correct answer. It is best to solve such a problem in groups. Groups allow as many of the concerned parties as possible to influence the decision. Groups may contain members who are competent at different parts. In this way, groups can perform complementary assignments better than individuals. However, this is true only if the groups can coordinate their efforts efficiently. As for the group size, it is difficult to create general rules for the ideal group size. A person should instead understand the manner in which different group variables relate to one another. This will lead to better decisions concerning group size that any rules of thumb could provide.



As far as Lebanese managers are concerned, all the respondents to the researcher's questionnaire declared, with no hesitation, that group decision making is much "healthier" for the organization than individualistic one, yet they managed to keep their own personal individual practices as an exception to the *rule*. As for the members of the decision making group, and in most of the Lebanese businesses, they are usually the owners of the business; and since most of the businesses are family-owned ones, decision makers happen to be either brothers or cousins, irrespective of their academic achievements or leadership traits.

## **B. Leadership**

Whenever people talk about decision making, they are tempted to think of several people sitting around a table with one person, presumably the leader presenting what he has, and suggesting different alternatives. This latter person is of great importance to the decision making process, the reason that let the researcher inquire about his/her characteristics.

Even though a considerable percentage (87%) of Lebanese managers agree that leadership is not restricted to a position in a role network rather to certain individualistic characteristics (refer to chart 1, chapter 4), a remarkable contradictory practice is realized: Almost all top managers, belonging to this same category, limited Leadership traits to themselves and assumed that a leader can not be but a top manager. This remark expresses the degree of ambiguity Lebanese managers have concerning the concept of leadership, and this might be related to the Lebanese culture that relates power and authority to "positions" and not to "qualifications."

This research, like many researches that preceded it proved that leadership is not solely a matter of traits, style, or emergence. Yet, it is a combination of these issues. That is, personality traits do not predict leadership ability, and leadership ability is not constant across situations. However, despite this conclusion people must not completely dismiss the trait approach to leadership. The style approach makes a significant contribution to one's knowledge about leadership. The manner in which a person leads is important. According to this research, most Lebanese managers (70%) believed that the democratic style of management is most effective in group decision-making. 27% of them practiced the autocratic style of leadership, and the rest were for the laissez-faire style (refer to chart 5, chapter 4).

However, one must remember that neither the democratic nor the authoritarian style is inherently the "best." Why is this true? The situation has a great impact on the success of particular leadership styles. It is true that most of the times group members are satisfied as long as they feel that their input could influence the leader, but this does not mean that this is healthy and general for group decision making. It can be claimed that leaders tend to be directive when tasks have clear objectives or when the tasks are routine. They also are not to delegate authority to other group members in these situations. In contrast, leaders are likely to delegate decision making responsibilities to other members when the tasks are rather complex. This is also true if the tasks require more initiative from members. It is worth mentioning also that a leader who might perform well in one group, might be the poorest in another. At least, that is what 60% of Lebanese managers agreed upon (chart 4, chapter 4): "...Knowledge of the business is not inherited, it is attained through experience..."

The research concludes, regarding the concept of leadership, that the majority of top-level management agrees that there is no one known as a "naturally born leader". Leadership emerges after the assurance of existence of several qualification. Knowledge and personality traits come in the first place, with the assurance of all of the interviewed managers; Charisma is that quality that 73% of the managers agreed upon, and experience and style of management followed sequentially (refer to chart 2, chapter 4).

Moreover, this research emphasizes the quality of the leader-subordinate relationship as an important factor affecting group productivity, morale, and goal attainment. Leaders should be always willing to promote open communication in which he/she listens attentively to all contributors. This is what 83% of the interviewee emphasized. "Encouragement of participation" through positive feedback was the quality of a leader that 77% of the respondents raised. Also 33% of the respondents agreed that a group meeting full of tension would lead to disappointing results; that is why a successful leader would be that one who provides productive outlets for tension in group meetings (refer to chart 6, chapter 4).

### **B.1. Personality in Decision Making**

The basic psychological force affecting a decision maker is his or her personality. Personality may be said to encompass the characteristic traits and patterns of adjustment of the person in his interrelationships with others and his environment. Personality is the entire system of relatively permanent tendencies, both physical and mental, that are distinctive of a given individual, and determine his characteristic adjustments to his material and social surroundings.

The link between personality and decision making is not a simple one-to-one relationship. Managers do not merely act out their private motives in

organizational affairs. Rather, they transform childhood experiences, disappointments, and memories into action. In this transformation external reality is as important as the non-rational side of the decision maker's nature. Many managerial actions appear to be puzzling, inconsistent with organizational role, or simply incomprehensible. But such actions begin to make sense, and in fact can be seen to support persistent inner direction, once the nature of the individual's inner conflicts and the defenses used to cope with these conflicts are uncovered.

Personality traits contribute significantly to leadership (refer to chart 2, chapter 4). All interviewed Lebanese managers emphasized intelligence as a major trait in a successful leader. Most of the respondents highlighted the qualities of being persuasive and dependable as being essential and necessary qualities for becoming an efficient leader. What could be concluded, concerning this issue, is that all managers agreed that the term "personality" cannot stand alone as a support for a group leader; several traits stand behind it. In addition to the ones just mentioned are creativity, enthusiasm and dynamism, responsibility, critical thinking ability, originality, and verbal facility.

Managerial decision making represents a learned psychological process that is entangled with the decision maker's personality: *Election of choices from among many alternatives clearly represents a psychological process that is learned. Man is not born with the ability to make decisions nor does he acquire this capacity very effectively simply through the process of trial-and-error in growing older. Rather he develops competency in decision making by a series of carefully organized experiences that are properly paced to his development and psychological readiness*<sup>2</sup>.

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<sup>2</sup> E. Frank Harrison, The Managerial Decision Making Process, Houghton Mifflin Company, Boston (1981), page 186

It is hard to dispute the influence of personality on the process of choice: Effectiveness in decision making is directly related to the effectiveness of the executive personality. The successful personality makes decisions freely without the compelling forces of hidden personality factors. Thus, the successful decision maker knows how to prevent his own errors and works on himself to improve his decisions.

### **C. The Decision Making Process:**

Decision making in formal organizations should take place as an interrelated and dynamic process. Since the making of decisions in the real world is often unstructured, a process-oriented approach may seem different from traditional ways of arriving at a choice. Nonetheless, the benefits of this approach are considerable, and its use seems certain to improve managerial decision making in organizations of all types.

The researcher aimed at finding out whether Lebanese top-managers are aware of what decision making really is or not. This is because the definition of decision making as a process consisting of several decision making functions is advantageous for several reasons: (1) it indicates the dynamic nature of decision making; (2) it properly depicts decision making activities as occurring over varying spans of time; (3) it implies that the decision-making process is continuous; and (4) it properly suggests that, at least to some extent, a managerial decision making can direct and control the nature, degree, and pace of change within the organization.

Identification of mutual concerns, even though being the essence of a right and complete decision making process, appeared to be underestimated by 37% of the respondents (refer to chart 11, chapter 4). This is really disappointing for the group would suffer loss of time, negative feelings generated, and interpersonal problems that are created because of having some of the members attending a group meeting physically and not mentally. That is to say, all group members should be aware of the concern and the objective of the meeting before starting to discuss any other issue.

Note that there is a difference between “sharing a mutual concern” and “defining a group goal.” This difference, that 87% of the respondents were unable to detect, lies in the degree of specificity that the concern has. A group goal is usually broader than the mutual concern that is usually related to a specific problem (refer to chart 14, chapter 4).

Even though 97% of interviewed managers agreed upon that some decisions have to be enforced by them without giving group members the opportunity of showing their corresponding opinion, an immediately preceding declaration by these same managers was that decision making should be the outcome of group interaction (refer to chart 7, chapter 4). So, the researcher continuously sensed the respondents’ attempts to validate their “one-man-show” that they seem unable to abandon even though they are quite sure that group decision-making is the safest way to mature and effective decisions.

Alternatives should be always thought of: contingency plans should be always available. Yet, few are those who knew or pointed out the importance of “consensus,” and ways of reaching it (only 13%); Some points are suggested by the researcher in what follows to handle this problem<sup>3</sup>:

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<sup>3</sup> Charles Pavitt & Ellen Curtis, Small Group Discussion, Gorush Scarisbrick Publishers, Scottsdale, Arizona (1994), page 433

- 1- Members should avoid arguing for their “pet” proposals.**
- 2- Groups should avoid “us against them” statements in which each side in a dispute must either “win” or “lose.”**
- 3- Members should not comply with a group majority if they do so only to avoid conflict.**
- 4- Groups should not use rules for decision making that allow them to avoid conflict, such as a “majority wins” rule.**
- 5- Groups should view differences of opinion among members as natural and helpful.**
- 6- Members should consider that their early, initial agreements are suspect and premature.**

Strange was the inability of 23% of the respondents to formulate the decision-making process in a number of sequenced steps (refer to chart 9, chapter 4). This is the case after all of them agreed that it is a process. However, 77% of the managers could succeed in developing the decision-making process in a systematic, rational, and practical way that is almost the same as the Systems Analysis approach, presented in chapter 2.

The research suggests that 83% of the managers presume that one of the pitfalls in group problem analysis is “too early emphasis on possible solutions.” The very cause of premature decisions. Groups can make decisions prematurely if

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members do not examine their options sufficiently. One way to avoid this is to split a group into two: one "suggesting" and the other "criticizing" until a consensus is reached. Moreover, decision makers might face the problem of lack of specific information needed. That is why group members should not rely solely on estimated figures they have in mind. Field studies should be adopted for it would take the Lebanese business market a considerable amount of time before it can generate its own business statistics and charts concerning the different fields decision makers are after (refer to chart 15, chapter 4).

Another pitfall raised by 67% of the respondents (refer to chart 15, chapter 4) is the confusion between disagreement and dislike. Disagreement is an essential part of the decision making process. It provides the opportunity for more than one suggested solution to be considered; it insures individuals the opportunity to use their unique experiences, attitudes, and beliefs; and it is a primary part of democratic action. Behavior that shows disagreement frequently looks, or sounds, like dislike; and frequently, it is taken to mean just that. But dislike is almost universally negative in its influence, disrupting cooperation and reducing hope for a reasonable analysis and resolution of problems. In almost every instance a person's response to perceived dislike is to avoid interaction, and of course in some cases it heightens hostility and aggression.

However, it is worth mentioning that this confusion between disagreement and dislike, that a considerable portion of the Lebanese managerial sector experiences, reflects some sense of lack of profession among decision-making people. That is, it shows some sense of subjectivity that is agreed to have negative effects on the decision-making process (refer to chart 22, chapter 4).



It cannot be thought of anything more important for those would seek to improve their ability to participate effectively in decision-making groups than to encourage them to become more capable of selectively identifying and discriminating between reasonable (or even unreasonable) disagreement and personal dislike. This will help reducing the friction and interpersonal conflict confronting so many people today.

#### **D. Brainstorming: A Suggested Technique**

90% of the interviewed managers assured that they use “brainstorming” in their decision making process (refer to chart 16, chapter 4). Yet, a conflicting figure was estimated when referring to middle management! Brainstorming is a technique to help groups generate proposals for alternative courses of action. It was never intended as a method for carrying out the entire decision making process. It is believed to be a way to help people make more creative proposals than they otherwise could have. Interviewed managers seem to be particularly afraid that the group will dislike their “craziest” notions. Therefore, group members are usually afraid to express their ideas in public. This is a significant drawback because “crazy” ideas are sometimes the most creative and best solutions to problems. Hence, a technique for generating ideas in groups that would make people comfortable enough to express even their most “of-the-wall” ideas is brainstorming.

Brainstorming is an easy technique. The first step is to choose a person to write down all the proposals that the group generates. Next, the members call out their ideas. They should be doing so under the following unique conditions:

- 1- Under no circumstances can a member evaluate any proposal. Encouragement is fine, but the group does no evaluating until a later stage. This will let people feel free to express any ideas they have. Yet, this is not the case in most of the brainstorming sessions conducted in Lebanese businesses. Top-managers believe that they should be continuously evaluating any suggested idea, otherwise drastic conflicts would be generated that no one could resolve.
- 2- The members should attempt to generate as many ideas as possible. A large quantity of options should ensure that at least a few of them will be good. Nevertheless, the researcher found out that managers have the tendency to stop the session and move to the evaluation phase having in mind that they are doing the appropriate thing- for they are avoiding loss of time.
- 3- Participants should "freewheel," that is, attempt to come up with the wildest proposals they can imagine. Most of these ideas will no doubt be bad, but one of them may instead turn out to be a stroke of genius.
- 4- Members should "piggyback," that is, generate ideas that build on suggestions of other group members.

Brainstorming is most appropriate when group's task is specific and fairly limited in range. Under these conditions, the technique will lead to proposals that are most likely to be feasible and least likely to be so numerous that they overwhelm the group. all interviewed managers agree on the fact that brainstorming is the best way to produce more imaginative alternative approaches to a specific problem. 55% of them saw that it is a technique by which group members can free themselves from inhibition and self-criticism (refer to chart 17, chapter 4). A disadvantage of brainstorming is that the sheer number of options

can force the group to spend a great deal of time evaluating possible courses of action. Further, members express many potentially good ideas in a vague form as they brainstorm. Consequently, the group needs a great deal of time to formulate more precise versions of these options to evaluate them properly.

After all, Lebanese managers seem not to understand the real potentials of this technique, and that is why they are not getting the best of it when used. Unfortunately, "thinking loudly", is the comprehension of most of these managers of brainstorming.

### **E. Personal Values and Decision Making**

The personal values of the decision maker and the values of the organization significantly influence the entire process of decision making. For example, the decision maker must consider the values of the organization in setting managerial objectives. The search activity will reflect the personal values of the decision maker attempting to shape the information obtained into alternatives that relate to managerial objectives. Once the search activity is completed, the decision maker's personal values, conditioned by the organizational values reflected in managerial objectives, influence the comparison and evaluation of alternatives. And, of course, at the moment of choice this same combination of values prevails. The making of the choice initiates the implementation function, in which the values of the organization usually supercede those of the decision maker. Finally, in the follow-up and control function of the decision-making process, the standards for measurement and corrective action to ensure outcomes in keeping with the managerial objectives reflect organizational values.

At any and all points in the integrated process of decision making, the personal values of the decision maker may conflict with the values of the organization. This is when subjectivity begins to drag the decisions from being professional, unbiased, and the outcome of complete and enough analysis. The more people let their personal value interfere in the decision-making process the more apt they become to being subjective (refer to chart 22, chapter 4). In the presence of such conflict, the decision maker must often subordinate personal values to the values of the organization. This is the case because a manager is assumed to personify the organization; and a manager's satisficing choice, made within the bounds of rationality, should further the basic purposes of the organization.

Interviewed managers seem to believe that they could reduce the harm of group members' conflicting values by increasing their commitment to the group tasks. In this way, members would be committed to the group's concern and not to their personal values solely. Verbal appraisal is thought to be the best way to increase a member's commitment to task for 87% of the respondents (refer to chart 18, chapter 4). 53 % of respondents agree that "bonuses" serve the purpose, and 67% of them believe that "promotions" is an attracting alternative that could serve the same purpose. It is worth mentioning that a member's attachment to personal values leads to forming a group of "minorities" within the decision-making group- in case of conflicting values. When asked about the way top-managers should follow to keep the group coherent, 33% of the respondents gave answers that only autocratic leaders would declare (refer to chart 20, chapter 4). The rest were for the democratic style of leadership where the decision is that of majority.

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## **F. Techniques For Decision Making**

Until recently, decision makers in business have had to rely largely on intuition, experience, and luck when wrestling with tough-to-quantify trade-offs in multiple choice situations. But now, refined quantitative tools are gaining favor among managers in leading companies as another source of information for analyzing complex issues and confirming intuitive impressions.

The need to rely upon luck in many corporate decisions is, at least in part, a consequence of the increasingly complex and subjective nature of contemporary business. Many important issues seem to defy quantification, and decision makers are often forced to rely on their intuition and experience to a greater degree than may be desirable.

There are many quantitative techniques available to help the decision maker arrive at a choice that meets his or her objective. 57% of the respondents declared that they use such techniques indirectly (refer to table 23, chapter 4). The decision maker may, depending upon training and inclination, apply such techniques at any point in the decision making process. However, most quantitative tools are especially applicable in the comparison and evaluation of alternatives.

*“ The contribution of quantitative techniques to decision making is largely in the appraisal step, the analysis of decision possibilities. Quantitative techniques are unable to suggest hypotheses or to define problems or to suggest alternatives. These abilities remain in the domain of personality, experience, and creativity. But once alternatives have been defined, these techniques can be powerful tools for making quick and accurate appraisals.”*

It is doubtless true that the use of various quantitative techniques can result in quick and accurate appraisals. But such appraisals do not, as is often assumed, make up the entire decision-making process. Numerical data are only as reliable as their underlying assumptions and the specific way in which they are applied. Perhaps most important, many variables in the decision-making process are not amenable to quantification, and many others that can significantly influence the outcome of a choice are beyond the decision maker's comprehension or are inaccessible within time and cost constraints. This situation suggests that the rational decision maker should use quantitative tools only when they clearly apply and even then only with a full appreciation of their limitations.

Quantitative techniques, if used wisely by the decision maker, can reduce uncertainty and so yield choices that are more likely to result in reaching the original objective. Note though, that too much reliance on quantitative techniques may mean that the decision is effectively being made in the closed decision model. For example, a decision maker may assume that he or she possesses all the alternatives related to a particular objective within the framework of a payoff table, and that it is simply necessary to select the alternative with the highest expected value. Such a decision maker is operating under the faulty assumptions of the closed model. Such decisions are grossly simplistic and can lead to consequences that are unfavorable to the organization, or at least less favorable than if the open decision model had been used. None of interviewed managers seemed to have faith or full estimation of the capabilities and contributions offered by quantitative techniques- even though some mentioned the contrary (refer to chart 23, chapter 4). They seemed to resent anything that is related to machines or computers. This technology aversion, exhibited mostly by managers who belong to the past generation, goes back to this gap found between two generations that are differently oriented regarding decision making and problem solving.

A recent research conducted by a colleague, Omar Bahlu (1994), found out that Lebanese managers prefer qualitative techniques for the quantitative ones. It is usually the case that they are dissatisfied with quantitative ones. Yet, the latter found out that this dissatisfaction was due to ignorance and impractical applications used. Moreover, Bahlu found out that "age" is playing a negative role concerning familiarity and with quantitative techniques. In fact, the older the manager is the more unfamiliar he/she seems to be with both quantitative and qualitative techniques. Bahlu, continued to emphasize the importance of the missing training sessions that should be conducted frequently to increase user's involvement in such techniques that are designed to facilitate the decision making process.

However it should be mentioned that the researcher could realize that most of the respondents were somehow confused when answering the question related to quantitative objective techniques<sup>4</sup>. This confusion gives a clear significance of the ignorance of most of the Lebanese businesses of the importance of quantitative approaches for decision making. Analysis of strategic outcomes seems to follow the biased subjective approach rather than objective ones. This is although most of the managers were for objectivity in decision making rather than subjectivity (refer to chart 22, chapter 4). 80% believed that subjectivity leads to emotional and biased estimations, yet most of them failed to give any accurate information about quantitative objective techniques.

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<sup>4</sup> **Researcher's Personal View**

## **G. Technology**

Whether Lebanese managers follow qualitative analysis or quantitative analysis in the decision making processes was of concern to the researcher. Yet, the findings were very confusing for the degree of confusion that managers themselves have regarding these two distinct approaches. When inquiring if Lebanese businesses follow any of the theoretical approaches suggested by the Americans, like Systems Analysis or the Analytical Hierarchy Process, respondents were very hostile towards these techniques and a high percentage of them "could" find dozens of deficiencies in them rather than efficiencies (refer to chart 24, chapter 4).

When asked about the quantitative techniques that need computers to go hand-in-hand with them, most of the managers, and especially the uneducated ones, felt frustrated and refused to let computers interfere in the decision making process. 47% of the managers believed that man should not rely on computers at all (refer to chart 25, chapter 4). Only 20% believed in the complete reliability on computer in decision making. The rest could regard the new technology as a support to manpower and not as a substitute.

It should be noted that technology requires specialized manpower. The inevitable counterpart of specialization is organization. If there are many specialists, coordination will be a major task. So complex, indeed, will be the job of organizing specialists that there will be specialists o organization. More even than machinery, massive and complex business organizations are the tangible manifestation of advanced technology.



Whether one is referring to a highly advanced technology or a relatively simple, craft-oriented technology, technology and managerial decision making appear to be closely tied. Knowledge is applied to practical tasks (technology) by decisions that divide labor, identify and establish specialties, and implement a formal task structure.

As a general rule, the more complex the technology, the more dynamic the environmental texture within which the organization must operate. In combination with the economic system, the political system, and the social system, technology confronts managerial decision makers with an imposing array of environmental forces that persistently intrude into the organization at all levels and in a multitude of ways. For an organization to keep accomplishing its basic purposes, it must learn to interact effectively with external forces by whatever strategy, tactic, or means is appropriate to the environmental texture and the situation at hand. This is, of course, the primary reason why the external environment must be considered a highly significant boundary of rational managerial decision making.

Business and Competition are two interrelated concepts. One's business cannot be successful had it been unable to stand against competitive threats. To be able to do this, technology is the only path. This is whether we are talking about production, or organized management. Yet, the researcher is not asking to let machines replace manpower, because, even if he is asking to, this would never be attained. Technology is created to serve manpower. It is humans who assign the duties of these machines. Computers are highly recommended for the decision making process to facilitate the operations and turn all ambiguous data concerned into meaningful organized information. What could take weeks and months of hard manual work, could be executed in seconds using advanced technologies.

Awareness of these facts are recommended. All managers should know that they can benefit from computers in many ways. This awareness can be attained by attending managerial global and local seminars, or by letting the new fresh-graduate generation manifest their beliefs in computers capabilities in the real business world.

Finally, the researcher would recommend the following points to improve the decision-making techniques that are currently applied in Lebanese businesses. In fact, the following would help to initiate the decision making process for it is not done systematically or scientifically in most of the Lebanese businesses:

- 1- Hire young educated managers, who are ready to accept any new innovation and try to get the best of it within his business domain. Such managers would be willing to apply decision making techniques that could best serve the organization's purpose.
  
- 2- Re-educate senior managers and train them to adapt to the newly introduced technologies, and supply them with updated theories and recommendations for effective decision making. This category of managers should be trained to accept these new recommendations willingly, with no aversion, and try to get the best of them in correspondence with their business environment and conditions.
  
- 3- Make sure that decision makers have an acceptable comprehension of the real attributes of decision-making groups from leadership, to personality traits and group dynamics. A decision maker should be enriched with knowledge, for knowledge of these concepts would be the most appropriate weapon against subjectivity in decision making.

- 4- Conduct seminars and awareness sessions showing the different aspects of the group interaction process, showing the advantages of group work over individualism in decision making.
- 5- Special sessions should be offered to managers promoting the usage of computer applications that would enhance the efficiency of the decision-making process.
- 6- Rely on Brainstorming as an effective way of gathering possible alternatives, the thing that would turn a decision to be nearest to the best decision possible.
- 7- Provoke managers to welcome new ,non-traditional, suggested techniques for decision making. Such techniques are flexible and can fit any business case, no matter how simple or complex it is.

Finally, it is worth mentioning that this research aimed to highlight the importance and concern that should be given to decision-making in business management. The researcher in considered no more than an initiator of a series of researches that should be conducted regarding the different aspects of decision making. So, this research, can at least be a benchmark for further research regarding all what the study has mentioned or missed.

## *Appendix I*

### Interview Questions

- 1- What is "Leadership" in your point of view ?
- 2- Can a leader of one group achieve leadership in another? Why ?
- 3- What is "Decision Making" for you ?
- 4- What is "Problem Solving" for you ?
- 5- Do you think that "Decision Making" and "Problem Solving" are related ?  
How ?
- 6- If you are asked to formulate the decision-making process in a certain number of steps, what would these steps be ?
- 7- Can you think of another approach ?
- 8- Do you consider the "identification of mutual concern", within a group, while studying or making a decision a critical phase in group decision-making ? Why ?

- 9- What could be some barriers to problem analysis? What should a group end up with after surpassing these barriers during the analysis phase ?
- 10- “Brainstorming” is a technique used to free group members temporarily from inhibition, self-criticism, and criticism from others, in order to produce more imaginative alternative approaches to a specific problem. Would it be a good idea to recommend “brainstorming” as a technique for evaluation of proposed solution? If yes, how long should this process go on, and how would you use the results of this technique? If No, Why?
- 11- Throughout your years of management, how much could you sense each of the following among your decision-making group members,
- Creative Thinking ?
  - Commitment ?
- what is the importance of each in the decision-making process?
- 12- Will the opinion of minorities be taken into consideration ?
- 13- Are you familiar with Systems Analysis (formulation ..... Search ..... Evaluation ..... Interpretation ..... Verification), the technique to teach decision makers to think in a special, orderly, and thorough way ? What are your critiques about it ?

14- What do you think about Subjectivity (revealing preferences by making pair-wise comparisons) in decision making ?

15- Are you familiar with the following objective approaches of decision making, and to what extent do you think they are reliable ?

- Maximin Criterion (Best Payoff Under The Worst Conditions)
- Minimax Regret Criterion- Savage (Smallest Loss Under The Worst Conditions)
- Weighted Extremes Criterion-Hurwicz (Applying Arbitrary Weights)
- Game Theory (Multiple Strategies)

16- To what extent can a company rely on computer applications for decision making ?

17- Based on the following figure I am presenting to you, what can you say about the effectiveness of the “Analytical Hierarchical Process” for decision making ?

## Appendix II

### *Basis of Descriptive Statistical Analysis*

The following is what the researcher has relied on to come out with his research findings. From these main points, he could come out with the corresponding frequencies and percentages.

1- A leader is a person first and a position in a role network second.

Agree

Disagree

2- Leadership is a matter of:

- Charisma
- Personality Traits
- Experience
- Knowledge
- Style of management

3- Personality traits that should be in a group-leader are :

- Dependability
- Intelligence
- Self Confidence
- Enthusiasm and Dynamism
- Originality
- Responsibility
- Verbal Facility
- Critical Thinking Ability
- Creativity

4- A leader in one group can achieve leadership in other groups.

Agree

Disagree

5- Which style of leadership is most effective in a group?

laissez-faire

Autocratic

Democratic

6- The quality of the leader-subordinate relationship should be stressed as an important determinant of productivity, morale, and other goals desired by the group. A leader should

- Encourage participation by everyone in the group
- Keep everyone in a friendly mood
- Respond to the emotional concerns of group members when that is appropriate
- Promote open communication
- Listen attentively to all contributors
- Encourage with positive feedback
- Show enthusiasm and good humor
- Promote pride in the group
- judge accurately the changing moods of the group
- Provide productive outlets for tension

7- Preliminary to any discussion of the group decision-making process, there should be a full understanding of "decision-making" as a key term. Decision-making is

- synonymous with problem-solving
- a process that includes some types of problem solving and much more
- the outcome of group interaction
- inevitably a choice made by group members from among alternative proposals available to them
- accomplished as members achieve consensus on a proposal



8- Some decisions should be enforced by the group leaders or the highest-ranked person in a group

Agree

Disagree

9- If asked to choose a number of steps from among the following ones and put them in a sequenced order what would be the right order of the decision-making process in your point of view? (put steps in a sequenced order from 1 to .....)

- Study the advantages and disadvantages of the proposal offered by the boss
- Analyze the nature of the problem
- Vote for a proposal
- Agree on the goal
- Compare of solutions' payoffs
- Define the nature of the problem
- A difficulty is expressed or felt
- Agree on the solution
- Suggest possible solutions
- Implement best solution

10- A follow-up plan should be ready after implementation of any decision

Agree

Disagree

11- It is extremely important that members of a group check with each other on the nature of each individuals concern before they begin to try to find a solution to the problem.

Agree

Disagree

12- With identification of mutual concerns

- Cohesiveness increases
- Tolerance of personal differences in viewpoints increases

13- Without identification of mutual concerns

- Time is wasted
- Negative feelings are generated
- Interpersonal problems are created

14- What is the difference between sharing a mutual concern and defining a group goal?

- No difference
- The “degree of specificity” is the difference: when a group sets a goal, it should be specific enough so that members could tell when it is achieved.

15- There are common pitfalls in group problem analysis that help account for the difficulty that may groups have in reaching an agreement. Some of these problems are:

- Too early emphasis on possible solutions
- Lack of specific information
- The assumption that truth will emerge
- Confusion between disagreement and dislike
- Frustration of group members.

16- A technique used to identify the possible approaches to a problem is called “brainstorming”. You as a manager

- are familiar with this technique, but do not use it
- are familiar with this technique and use it frequently
- are not familiar with this technique.

17- If you are familiar with this technique, what do you think its objectives are?

- Free group members temporarily from inhibition, self criticism, and criticism of others.
- Produce more imaginative alternative approaches to a specific problem.
- Increase group cohesiveness.

18- What would be a good way to increase a member's commitment to task?

- Bonuses
- Verbal appraisal
- Promotion.

19- What would be a good way to increase a member's creativity?

- Work experience
- Seminars
- Successive training sessions
- Interaction with employees of other companies.

20- In what way should a manager, or a group leader, deal with the group members who oppose the opinion of the majority of group members ?

- They have to know how group work goes: The opinion of the majority "wins"
- They should know from the very beginning that the final decision is for the top manger
- Experience is capable of letting them adapt to such situations.

21- A technique to teach decision makers to think in a special, orderly, and thorough way is called Systems Analysis. It follows the following phases: 1- Formulation; 2- Search; 3- Evaluation; 4- Interpretation; 5- Verification of results. What would your evaluation of such a technique be?

- It is an excellent technique, but it can be rarely practiced
- It is a logical technique that we use in our daily business life
- The applicability of such a technique relies heavily on the situation we are concerned about
- There are better approached to decision making we apply in our business.

22- What do you think of subjectivity in decision making?

- The more subjective a decision maker is, the farther he is from being professional
- No one can be objective in management, it is human nature !
- Subjectivity means being emotional, biased, unfair, and giving less time for analysis.

23- What do you think about quantitative objective techniques for decision making? (techniques like minmax, maxmin, hurwicz alpha, game theory ..etc.)

- These techniques require a large budget and considerable time: it cannot be afforded in our businesses
- These techniques cannot be used theoretically; we use them indirectly. It is a logical technique that we use in our daily business life
- The applicability of such a technique relies heavily on the situation we are concerned about

24- What do you think about the "analytic hierarchy process" as a method for effective decision making?

- It can be effective, but we have never used it
- It can be effective for individual decision making and not group decision making
- It is applicable only for very huge projects with many key factors affecting the project.
- It is not a practical technique

25- To what extent should managers rely on computers in the decision making process ?

- Managers should not rely on computers in decision making at all
- Computer output should be supportive to human decision making
- Computers are only needed to speed up the collection of data, and turn data to organized information
- Managers should let computers perform the decision making process entirely
- Computers would fail to perform decision making, especially in Lebanon, with the unorganized business operation and the many key factors interfering in Lebanese businesses.

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